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Canadian Federalism and Infrastructure

Allan, Gordon, Hanniman, Juneau and Young

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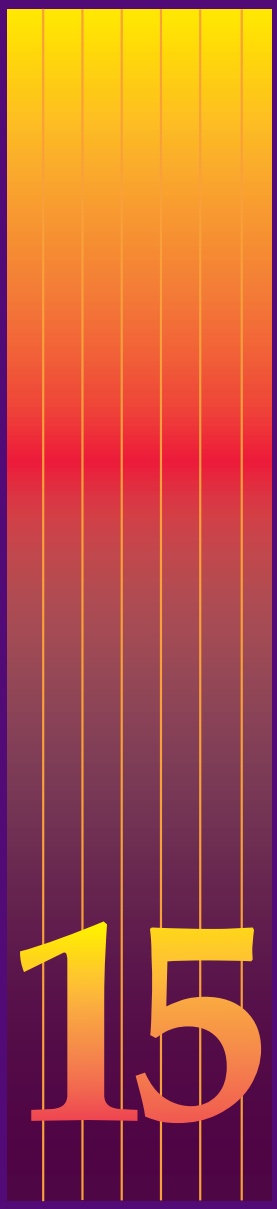

Edited by
John R. Allan,
David L. A. Gordon,
Kyle Hanniman,
André Juneau, and
Robert A. Young

Institute of Intergovernmental Relations

Institut des relations intergouvernementales

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INSTITUTE OF
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School of Policy Studies
Room 412, Robert Sutherland Hall
138 Union Street
Kingston, ON K7L 3N6 Canada
www.queensu.ca/iigr/

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PREFACE

The 2015 State of the Federation volume, *Canadian Federalism and Infrastructure*, focuses on the intergovernmental aspects of financing the infrastructure investments that have been and continue to be crucial to the well-being of Canadians. Federal and provincial budget speeches are replete with references to the problems of maintaining and expanding the required levels of investment, while virtually every municipal government—collectively the largest owners and managers of the road, water, sewage, and transit systems on which we depend—clamours for assistance with the enormous costs entailed in maintaining and replacing our aging infrastructure and expanding it in response to population growth. The pressures on our larger urban centres are particularly acute as they grapple with the continuing urbanization of population and their status as the preferred destinations for a substantial majority of immigrants. While there are diverse views as to how best to manage our infrastructure problems, there is virtual unanimity that success will depend critically on our achieving the required level and effectiveness of intergovernmental collaboration. The challenges to achieving this goal were the primary focus of the papers presented at our 2015 conference, which are gathered in this volume. The IIGR is very proud to present this latest *The State of the Federation* series, now in its fourth decade.

The 2015 conference was organized by John R. Allan, then interim director of the IIGR, David Gordon, director of the School of Urban and Regional Planning at Queen's University, André Juneau, a former director of IIGR and the first deputy minister of Infrastructure Canada, and Robert Young, a long serving Fellow of the Institute now retired from Western University. Kyle Hanniman, now the associate director of IIGR, joined this group later on, and together they comprise the editorial team for the present volume. We thank them heartily and congratulate them on producing work of the very highest quality in this volume.

I would also like to thank Maureen Garvie, who copy-edited the manuscript, Mark Howes of the Publications Program of the School of Policy Studies, for cover

design, and Mary Kennedy, our indispensable institute administrator. Mary is the anchor of the institute and always ensures the smooth running of our conferences, events, and publications.

It is with great sorrow that I note the death of Dr. Robert Young, who helped to organize our 2015 conference and edit the present volume. These were simply the most recent of the innumerable contributions that Bob has made over many years to the institute. He has been a dear and valued friend of the IIGR, serving both as a fellow and as a member of the Advisory Council. His wisdom and wise counsel will be sorely missed. It is with great sadness that we dedicate this volume to his memory.

Elizabeth Goodyear-Grant
Director, Institute of Intergovernmental Relations
School of Policy Studies
Queen's University

DEDICATION

Robert Young, 1950–2017

This *State of the Federation* is dedicated to one of the volume's co-editors, Dr. Robert Young. Bob passed away in August 2017, while the volume was being prepared for publication.

As a professor of political science at Western University, Bob was one of the country's leading authorities on federalism and multilevel governance, a status affirmed by his Canada Research Chair in that field and by his election to the presidency of the Canadian Political Science Association. He was also a long-time friend and contributor to the Institute of Intergovernmental Relations (IIGR). Bob was a visiting fellow at the IIGR from 1992 to 1993, when he worked closely with then director Doug Brown to develop one of the institute's most successful research programs, and he sat on the IIGR's advisory council after his fellowship until his death.

Bob's research will be long remembered not only for its depth and breadth but also its interdisciplinary and comparative reach. He published on a number of topics, including the political economy of New Brunswick, free trade, municipal politics, and secession, and he did so from an impressively diverse range of intellectual perspectives. Nowhere was this more evident, perhaps, than in his most widely cited book, *Secession of Quebec and the Future of Canada* (first published by the IIGR and McGill-Queen's University Press in 1995). In it, Bob spelled out, with his characteristic insight and learning, the economic and political implications of a "Yes" vote and the form that negotiations between Canada and Quebec would likely take. Not only was the book widely read among political scientists, but it also won the Canadian Economics Association's 1996 Douglas Purvis Memorial Prize for the best work on Canadian economic policy.

Bob remained a devout student and contributor to Canadian federalism till the very end. He volunteered, just months before his death, to help the IIGR open a dialogue with the Quebec government over its recent affirmation policy. It is unfortunate that the resulting debate will not benefit from Bob's insight. But it is our great fortune to have learned from him on so many other occasions. His generosity, wisdom, and insight will be sorely missed.

CONTRIBUTORS

John R. Allan is a fellow and a past director of the Institute of Intergovernmental Relations. He is also vice-president emeritus and professor of economics emeritus of the University of Regina.

Richard Bird is professor emeritus of economics and senior fellow of the Institute on Municipal Finance and Governance at the University of Toronto.

Robin Boadway is emeritus professor of economics at Queen's University.

Pamela Blais is an urban planner and principal of Metropole Consultants Ltd.

Jacques Caron is associate secretary for public infrastructure, Secrétariat du Conseil du trésor, Québec.

Scott Clark is currently president of C. S. Clark Consulting. Mr. Clark previously served as associate deputy minister of finance (1994–97), deputy minister of finance (1997–2000), and senior adviser to the prime minister (2001).

Richard L. Cole (1946–2017) was professor emeritus of urban affairs and political science and former dean of the School of Urban and Public Affairs at the University of Texas at Arlington.

Gabriel Eidelman is associate director for teaching innovation and assistant professor at the University of Toronto's School of Public Policy and Governance.

Herb Emery is the Vaughan Chair in Regional Economics at the University of New Brunswick.

Michael Fenn was an Ontario deputy minister under three premiers. He is now a researcher and management consultant and a member of the board of the Ontario Municipal Employees Retirement System (OMERS) pension fund.

Bill Ferreira is the executive director of BuildForce Canada. Previously, Bill served for nine years as the vice-president of government relations and public affairs at the Canadian Construction Association. He has also served in a range of portfolios in the federal government, worked in a private consulting firm, and was director of government affairs for the Forest Products Association of Canada.

José A. Gómez-Ibáñez is the Derek C. Bok Professor of Urban Planning and Public Policy at Harvard University, where he holds a joint appointment at the Graduate School of Design and the John F. Kennedy School of Government

David L. A. Gordon is professor and director of the School of Urban and Regional Planning in the Department of Geography and Planning at Queen's University.

Kyle Hanniman is the associate director of the Institute of Intergovernmental Relations and assistant professor of political studies at Queen's University.

Martin Horak is associate professor of political science and director of the Local Government Program at the University of Western Ontario.

André Juneau is a former director and now fellow of the Institute of Intergovernmental Relations at Queen's University. He was the first deputy minister of the federal department of infrastructure. He currently serves as interim chief executive officer of the Windsor-Detroit Bridge Authority.

John Kincaid is the Robert B. and Helen S. Meyner Professor of Government and Public Service and director of the Meyner Center for the Study of State and Local Government at Lafayette College, Easton, Pennsylvania. He is former executive director of the US Advisory Commission on Intergovernmental Relations.

Harry Kitchen is professor emeritus in the Department of Economics, Trent University.

Chris McNally is the 2017 chair of the Canadian Construction Association, past president of the Ontario Sewer and Watermain Construction Association, and a founding member of the Ontario Construction Careers Alliance. He is a co-founder and director of Hamilton, Ontario–based C & M McNally Engineering Corp.

Greg Richard is chief economist of Fiscal Realities Economists. His prior experience was in government, working in the areas of economic development, intergovernmental liaison, and fiscal relations.

Matti Siemiatycki is associate professor of geography and planning, and Canada Research Chair in Infrastructure Planning and Finance at the University of Toronto.

Enid Slack is director of the Institute on Municipal Finance and Governance at the Munk School of Global Affairs at the University of Toronto. She has worked with the World Bank, the IMF, CIDA, UN Habitat, and other international agencies, advising on a variety of issues.

Robert Young (1950–2017) was professor of political science emeritus of Western University. His primary field of interest has been multilevel governance, including the municipal level of government and civil society.

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INTRODUCTION

John R. Allan, David L. A. Gordon, Kyle Hanniman, André Juneau, and Robert Young

At the 2013 meeting of the Advisory Council of the Institute of Intergovernmental Relations, part of the proceedings of the State of the Federation conference, members of the council had their customary discussion of possible topics for the next conference. Although there were serious contenders—Canadian conferences on intergovernmental relations seldom suffer from a lack of possible topics—there was general agreement that all three orders[1] of government were faced with critical infrastructure issues, and that these issues were unlikely to be resolved without concerted and coordinated actions by all three. It was therefore agreed that the subject of the 2015 State of the Federation conference would be Canadian federalism and infrastructure. The papers presented at that conference comprise the chapters of the present volume.

As the chapters in this volume make clear, infrastructure development by all three orders of government has been an important part of the history of Canada. The interaction of these orders in this area, however, is a relatively recent phenomenon. Traditionally, intergovernmental relations have been dominated by questions of constitutional jurisdiction, constitutional amendment, fiscal federalism, national unity, healthcare, and so on. It is safe to say that infrastructure, while not totally absent, did not figure prominently on the intergovernmental agenda until about the mid-1990s.

1. We refer to orders of government for ease of exposition, but we realize that, unlike the federal and provincial governments, the municipal level of government is not a constitutionally recognized "order."

In the last decade of the twentieth century and even more so in the first of the twenty-first century, infrastructure became a major concern for all three orders of government and emerged as an intergovernmental issue. While various factors contributed to this emergence, of undoubted importance was the fact that much of the earlier infrastructure investment was approaching, or had reached, the end of its useful life. Pressures for renewal and expansion were increasing, and groups such as the Federation of Canadian Municipalities and the construction and civil engineering associations added their voices to those of the cities in demanding increased federal and provincial spending on infrastructure. The availability of budget surpluses and private financing prior to the global financial crisis facilitated positive responses by senior orders of government. Moreover, the dominance of provincial and, particularly, municipal governments in the ownership of infrastructure meant that the federal government had to work with the other governments to realize its own infrastructure investment aspirations. Coincident with these developments were demands from the cities for a greater role in the federation. Although controversy continued over such perennial sources of disagreement as vertical fiscal imbalance and provincial demands for unconditional transfers, intergovernmental cooperation on issues of infrastructure has improved, and a great deal has been accomplished by increased collaboration.

With these developments as prelude, the Advisory Committee agreed that the time was appropriate to assess what had been accomplished respecting infrastructure investment, what still needed to be done, and how well intergovernmental collaboration was working to address outstanding issues. The 2015 Canadian Federalism and Infrastructure conference was the result.

The first session of the conference was intended to provide attendees with both a historical perspective on infrastructure investment in Canada, and a quantitative view of the magnitude of the infrastructure deficit experienced by local governments across the country. The former was provided by Herb Emery, University of New Brunswick, while the latter was a joint effort by Chris McNally and Bill Ferreira, both of the Canadian Construction Association, and David L. A. Gordon of Queen's University.

Dr. Emery's chapter in this volume presents a brief history of Canadian infrastructure for the period starting in 1870. He reminds us that not all the infrastructure required for economic growth is *public* infrastructure. Much of the infrastructure that serves the nation was privately financed, with varying levels of government involvement for the vast networks of railway, telegraph, streetcar, telephone and pipeline systems. Although some of these networks required start-up assistance and regulation, Emery observes that the financing issues of private infrastructure (rail, pipelines, telecom) have largely proved surmountable in the past half-century.

Emery notes that government involvement in public infrastructure tends to be lumpy and episodic, with a focus on construction rather than operations and maintenance. Government funding often comes with the politically attractive promise that access to the newly constructed infrastructure should be free, focusing upon

elements of the water supply, sewage, and roads systems that might be considered public goods. The system managers were often left with the operations and maintenance issues, without a revenue stream to fund them. Ironically, Emery observes that the government decision to make the use of most highways untolled had the perverse effect of undercutting the privately financed railway and streetcar networks.

During the 1950s and '60s, government infrastructure investment grew rapidly, when, as Emery observes, the federal and provincial governments made huge contributions to the construction of national and inter-provincial networks in waterways, electricity, pipelines, highways, hospitals, schools, universities, and social housing. In recent years, when urban growth has been the primary driver of infrastructure investment, the share of provincial and federal ownership has declined, and local governments are now responsible for over half of Canada's infrastructure stock. These trends, Emery suggests, have increased tensions between the orders of governments, because the municipalities have the least fiscal capacity and inadequate tools for capital investment.

The shift of infrastructure ownership to the local level is also noted in McNally, Ferreira, and Gordon's chapter, which outlines the current dimensions of the municipal infrastructure problem. Over half of the nation's infrastructure is now owned by local governments, which are responsible for maintenance, repair, and replacement, despite their limited fiscal capacity. Much of this core infrastructure (potable water, sewers, roads and transit) was built in what may have been the "golden age" in the 1950s and '60s and is now reaching the upper limits of its service life, with major reinvestment or replacement required in the decades ahead.

McNally, Ferreira, and Gordon note that the postwar era saw a fundamental shift in Canada's community structure to suburban lifestyles that have major implications for infrastructure policy. The nation's population shifted from rural to majority urban by 1931, served by relatively efficient water, sewer, and streetcar networks. The upgrades in the urban potable water and sanitary sewer networks in the early twentieth century had major public health benefits, reducing communicable diseases, decreasing infant mortality rates, and increasing adult lifespans. Then, postwar migration towards the "Canadian dream" of single homes and automobile travel led to mass suburbanization. By 2011, more than two-thirds of Canada's population lived in suburban environments that were far lower in density and more expensive to service than the pre-war cities. And over 85 percent of the population growth in metropolitan areas was at the distant and inefficient edges of these suburban communities, greatly increasing the demand for infrastructure investment.

Prior to 2011, there was no comprehensive national overview of the state of this core municipal infrastructure. The 2012 Canadian Infrastructure Report Card (CIRC) was a breakthrough modelled after similar analyses conducted for the United States by the American Society of Civil Engineers. Expanded and repeated in 2016, the CIRC is the most comprehensive survey yet of the state of Canada's municipal core infrastructure. According to the survey, one third of this core infrastructure is in fair, poor, or very poor condition, with the asset classes for roads, municipal

buildings and public transit exhibiting the worst condition. The replacement value for core assets in the worst condition (poor and very poor) is estimated to be $141 billion, with roads, potable water, and wastewater systems requiring the largest expenditures. More seriously, McNally et al. observe that the rates of reinvestment in maintenance, repair, and replacement are declining, so the situation will get worse.

McNally, Ferreira, and Gordon note that the 2016 Canadian Infrastructure Report Card has demonstrated how deferred maintenance costs accelerate later in systems life, and how replacement after failure is far more expensive than preventive maintenance. The proverbial penny saved by deferring maintenance can become a dollar in replacement costs. Unfortunately, they observe, short-term political cycles work against long-term life-cycle infrastructure maintenance.

The CIRC estimated the total stock of core municipal infrastructure to be $1.1 trillion in 2015, or approximately $80,000 per household. Many of these systems are essential for the health, well-being, and quality of life for most Canadian citizens. While the CIRC is among the best data sources for the 90 percent of Canadians who live in metropolitan areas and cities, the authors concede it does not cover the smallest towns and rural areas, which have their own distinct and difficult infrastructure problems. Also, the CIRC does not cover rural aboriginal communities, many of which have extremely serious infrastructure issues that must be addressed by entirely different intergovernmental policies.

The second session was concerned primarily with issues of infrastructure financing. The chapter by Enid Slack and Richard Bird, both of the University of Toronto, focuses on the disparity between how regional public transit in Ontario ought to be financed and how it is in fact financed. The paper that follows, by Robin Boadway and Harry Kitchen, of Queen's and Trent universities, respectively, is concerned to establish the architecture of federal fiscal arrangements that would yield an adequate level of both new and replacement infrastructure investment.

Slack and Bird begin their analysis by establishing what they call the Wicksellian Connection—essentially, the principle that efficient public-sector decision making requires a clear and meaningful linkage between expenditures and revenues—arguing that without an underlying agreement on who is going to pay, and how, one cannot decide sensibly what should be done. They note, for example, that the case of rapid transit in the Toronto region clearly demonstrates the non-viability of plans about what should be done when these lack an underlying agreement on who can or should pay. In addition to facilitating efficiency and accountability, linking expenditure and financing should also promote equity by ensuring that what is done and how it is financed are sufficiently fair to gain acceptability within the existing democratic institutional structure.

Despite the potential gains from respecting the Wicksellian Connection, Slack and Bird observe that Canadians have paid surprisingly little attention to the basic idea that local governments should charge for services provided whenever possible, tie the revenues received to the services that generated them, and limit the outlays on those services to the amount of revenue they produce. Too often,

decisions respecting the revenue and expenditure sides of local budgets are made independently and, given the influence of provincial governments on what occurs at the local level, sometimes with relatively little local input. The unsurprising result is that local expenditures may be little influenced by local revenue policy, and accountability is weakened.

An essential part of the remedy, Slack and Bird suggest, is to adopt what they describe as the first rule of sensible local finance: wherever possible, charge. Good user charges, they argue, not only produce revenue but also promote economic efficiency and make society as a whole better off. Public policy should therefore allocate the costs associated with a given benefit, including those generated by infrastructure, as much as possible to those who enjoy the benefit, either by user charges or by taxes paid by the beneficiaries. In the case of regional transit investment, the beneficiaries are obviously transit users and drivers who experience less congestion. But they also include visitors, businesses that gain from improved access, and property owners (whose property values increase because of improved transit.) It is thus clear that cities would need to supplement user charges with changes to property taxes and other sources of revenue to match benefits and contributions.

After considering how best to achieve fair and efficient financing of regional transit, Slack and Bird review the various proposals put forward to finance regional public transit investments in Ontario. Unfortunately, they find it necessary to begin their review by noting that several major studies make clear that "no obvious progress has been made in Canada in recent decades towards the goal of financing transportation more sensibly." In the five selected reports, however, they do find that the proposals for financing regional public transit demonstrate some awareness not only of the linkage between revenue and expenditure, but also of the potential gains from pricing. Despite this, they find evidence that, in Ontario at least, the decisions on what is suggested and what is seriously considered continue to be made on other grounds, although it is not always clear what those other grounds are.

Of the reports they reviewed, they conclude that the best example of applying the Wicksellian Connection to transit and road finance in the GTHA was that provided by Kitchen and Lindsey. Most importantly, it was the only one in which improved transit fares and highway tolls were mandated. More generally, Slack and Bird find that the basic problem in financing public transit is that it is in competition with the generally underpriced road system: if road use is subsidized to the degree it is, it will be impossible to pay for the needed transit infrastructure on a full cost-recovery basis.

Slack and Bird also share the view of Kitchen and Lindsey that the lack of an accountable and effective regional governance structure hampers the use of new financial tools. They observe that when inter-local agreements do not work, the province inevitably becomes the "regional" government, making regional transportation decisions and taking responsibility for levying region-wide taxes and charges. They conclude that the political advantages of providing services with "other people's money" are so great, and the technical difficulties in properly

evaluating and pricing many public services so formidable, that even exceptionally strong intergovernmental reporting and accountability structures are unlikely to yield public-sector efficiency in complex metropolitan regions like the GTHA, even in the presence of a strong metropolitan governance structure.

However difficult the challenge, Slack and Bird argue that progress can be made towards establishing a stronger Wicksellian connection between revenues and expenditures at the local level. The difficulty is that almost no one wants to hear truths as unpleasant as "users should pay" or that "redistribution through mispricing local public services is almost always a bad idea."

The focus of the Boadway-Kitchen chapter is not on the size of any infrastructure deficit, but rather on why such a deficit should exist. If, as is generally agreed, infrastructure investment is beneficial to society, why does government not freely pursue an optimum level of investment? This query prompts them to enquire whether the decentralized nature of such investment, in conjunction with the system of intergovernmental fiscal arrangements, causes under-investment in infrastructure. More generally, they seek to establish what the architecture of federal fiscal arrangements would look like if one wanted to ensure an adequate level of both new and replacement infrastructure investment. In attempting to resolve this issue, they provide a broad overview of those aspects of Canadian fiscal arrangements that bear on the level of infrastructure investment undertaken at each level of government, including the assignment of responsibilities, the division of tax room, and the structure of grants.

One conclusion that Boadway and Kitchen establish early in their analysis is that there is no systemic reason for provincial and municipal governments to under-invest in infrastructure. Indeed, expenditures on infrastructure can be used as an instrument of fiscal competition, for province building, as in the case of Alberta, to attract businesses and residents from other jurisdictions, possibly causing negative externalities. They conclude that no argument based on fiscal competition can be made for infrastructure to be under-provided by provinces and municipalities. They also caution against an easy advocacy of creating more tax room for the provinces as a remedy for perceived under-investment in infrastructure: this "solution" could jeopardize the harmonization of the tax system and exacerbate the problems associated with horizontal imbalances.

Boadway and Kitchen do recognize that there are reasons why infrastructure investment may be more constrained at the municipal level than at the provincial. They note, for example, the excessive reliance, by international standards, of Canadian municipalities on property taxes, and the fiscal pressures exerted on larger municipalities by the continuing internal migration of population to the larger urban centres and their status as preferred destinations for large numbers of immigrants. Provincial off-loading of expenditure responsibilities of a social or redistributive nature, without adequate fiscal compensation, has also exacerbated any problems the municipalities may have had in financing infrastructure. Again, however, the authors caution that in virtually every city in Canada, the property tax

could generate more revenue than it currently does, and that there is no evidence that raising the tax rate would lead to serious financial problems. Additionally, they note that there is a presumption that many, if not most, municipalities have not fully exploited their capacity to impose user fees, licences, permits, special assessments, development charges and similar levies.

It is in this context that Boadway and Kitchen find it necessary to sound a cautionary note relating to the importance of properly pricing or taxing for the use of municipal services. Too frequently, the tendency is to price services simply to raise revenues, without explicit consideration of the need to be fair, efficient and accountable. The too-frequent result is underpricing and an inflation of the demand for the infrastructure providing the services, thereby inflating the perceived infrastructure deficit.

Several important conclusions emerge from their analyses. First, the principle of subsidiarity supports a high degree of decentralized responsibility for the provision of infrastructure to the provinces and municipalities. Second, and as noted above, local infrastructure financing and provision are not constrained by serious problems of fiscal competition. Third, the federal government provides largely unconditional transfers by means of Equalization and the Canada Health and Social Transfers (these, while ostensibly for health and welfare, are in fact largely fungible) to the provinces that can be used for financing infrastructure. Finally, the case for providing federal transfers directly to the municipalities, which have access to the New Build Canada Fund and the Gas Tax Fund, is weak: essentially the same results can be achieved by making the transfers via the provinces, which would result in greater accountability. Only where a national purpose or benefit is served, one that is not being adequately considered by the provinces, may there be a case for direct federal transfers to municipalities.

Boadway and Kitchen's final conclusion is that, if it appears that the lower orders of government have difficulty financing necessary infrastructure investments, the remedy may be found in increased transfers—which is likely to be at the expense of accountability—or by increasing their tax room. They make clear, however, their belief that provincial governments already have significant revenue-raising ability and that further shifts in tax room may exacerbate already-large horizontal imbalances and jeopardize tax harmonization. At the municipal level, however, they see room for expanding and improving user fees, and recognize that there may be a case for giving large cities and metropolitan areas access to additional taxes accompanied by enhanced equalization across all municipalities within a province.

In the keynote address of the conference, Pamela Blais demonstrated that the primary cause of inefficient outcomes in metropolitan infrastructure policies is found in perverse pricing systems. Property tax policy and development charges are actively encouraging inefficient use of infrastructure in suburban sprawl and creating financial disincentives for more economically, socially, and environmentally sustainable alternatives. The development regulations and financial policies of the postwar era supported the dream of large families living in single detached homes

and driving everywhere on fast, uncongested roads. These policies may have been appropriate for returning veterans in 1945 and in the early years of the Baby Boom, but they are much less suitable for twenty-first century Canadian demographics.

In her chapter, "Distorted Infrastructure," Blais describes how price systems shape urban form if infrastructure development charges are based on average costs across a municipality, while most of the population growth is happening on greenfield sites at the lower-density outer edges, precisely where servicing costs are greatest. Drawing on her 2010 book, *Perverse Cities*, she demonstrates how mispricing and perverse subsidies inflate the demand for inefficient, low-density suburban sprawl, with its more expansive infrastructure systems, and how they artificially reduce the demand for more efficient infill development. Once again, providing free access to most roads and parking has resulted in a dramatic weakening of public transit, the mode that is potentially more efficient and sustainable. And the demand for free road capacity has usually outstripped supply in peak periods in many Canadian metropolitan areas, resulting in increasing congestion. California, one of richest US states, tried and failed to build its way out of congestion during the height of the American economic booms and is now experimenting with road tolls, congestion fees and paid parking.

Session 3 of the conference comprised three papers dealing with various aspects of infrastructure-investment decision-making processes. The first, by Matti Siemiatycki of the University of Toronto, identifies the principal factors responsible for the cost overruns and schedule delays endemic to major infrastructure projects, and suggests strategies for their remediation. In the second paper, the former director of the Institute of Intergovernmental Relations, André Juneau, draws on his experience as the first deputy minister of Infrastructure Canada to describe how decisions were formulated in the early years of that department, and to explore the relationship between infrastructure policy and Canadian federalism. The final paper of the session, by Jacques Caron, Secretariat du Conseil du trésor, describes the principal features of Quebec's ten-year infrastructure plan.

Siemiatycki's chapter is concerned with cost overruns and schedule delays on major infrastructure projects, and he sets himself the challenge of identifying their patterns, causes and cures. He notes that while the media regularly report on delays and cost overruns on high-visibility, major projects, they tend to report on each as an isolated case with its own unique explanation, while the problems of overruns and delays are in fact endemic. They burden governments with hundreds of millions of dollars of unexpected expenditures and erode public confidence in the capacity of government to deliver effectively vitally needed infrastructure investments.

What is necessary, Siemiatycki suggests, is that governments develop effective strategies to plan and deliver infrastructure projects. The purpose of the chapter is to identify approaches that they can use to improve the accuracy and efficiency of infrastructure-project delivery. To this end, he reports on a review of the extensive academic literature demonstrating the pervasiveness of cost overruns and construction delays; he identifies the causes of poor project delivery and proposes

strategies to minimize the occurrence of these problems. His principal finding is that most cost overruns and delays are attributable to three factors: technical challenges associated with the projects; over-optimism on the part of those involved; and strategic misrepresentation.

Among the technical challenges Siemiatycki identifies are changes to the scope of the project, and the change orders to which they give rise. Increased labour and material costs—and protracted delays provide more scope for these to occur—coupled with inaccurate forecasting and poor project monitoring are major contributors. By and large, these factors are predictable and thus subject to control, and should reflect improvement over time. Unfortunately, Siemiatycki finds little evidence that the managers of megaprojects are in fact improving their budgeting and scheduling skills. Rather, he notes the continuing prevalence of the all-too-human tendency to underestimate the costs and time required for megaprojects, compounded on occasion with deliberate misrepresentation to ensure the approval of projects promising political or professional gain.

Siemiatycki suggests that remedies to these problems can be found in international best practices, and he identifies five. First, the increasing sophistication and capability of data management makes possible significantly improved performance monitoring, reporting and information-sharing. Second, more predictable outcomes result when governments track and reward the best-performing companies and contractors. Third, investing in the management skills—particularly those relating to contract enforcement and dispute resolution—of staff who oversee megaprojects can yield substantial dividends in reduced overruns and delays. Fourth, each completed project adds to the knowledge base on which governments can draw to increase the accuracy of their forecasting techniques. Finally, the use of public-private partnerships has facilitated the bundling of multiple aspects of project delivery and the use of pay-for-performance contracts, both of which can contribute to on-budget and on-time project delivery.

Siemiatycki observes that some governments are already benefiting from the use of these techniques. There are, however, barriers to their wider adoption. Most obviously, the higher costs involved in providing advanced skills training and adopting more advanced techniques of data management and forecasting will deter some governments. And there are undoubtedly some parties who prefer to obscure the frequency and magnitude of cost overruns to evade accountability for project failures. Siemiatycki believes, however, that the inertia hindering the adoption of best practices is perhaps being overcome as the intense media coverage of failures makes both politicians and voters more demanding of public servants and government contractors.

The Juneau chapter explores the relationship between infrastructure policy and Canadian federalism. This exploration has three parts: the first is a framework to guide infrastructure policy; the second discusses the intergovernmental features of the framework; and the third examines a case study of the first four years of

what was then Infrastructure Canada, a federal department of which Juneau was the first deputy minister.

Infrastructure policy, he suggests, should be based on four broad principles: first, projects should be prioritized and related to policy purposes; second, decisions respecting priorities, purposes and projects should be taken by a broad range of actors; third, multiple funding mechanisms should be available; and, finally, project execution and monitoring should be effective and transparent, and undertaken by the appropriate actors. Juneau develops each of these principles in some depth, while providing valuable insight into them. He notes, for example, that the original categories utilized by the 2002 Canadian Strategic Infrastructure Fund were not well connected to purposes and "did not display a sense of federal jurisdiction." He is also of the view that clarity of purpose and an insistence on priorities will contribute to more productive intergovernmental relations.

With respect to financing infrastructure investment, Juneau notes that while a decision on financing is vital, the challenge may be to avoid thinking too much and too early about financing, most particularly if logically prior decisions have yet to be taken concerning purposes and priorities. He suggests that only when the latter have been determined is an answer to the financing question likely to be particularly helpful. Regarding the classic federal question of how to allocate funds across the country, he notes that political realities largely dictate a more or less equal per capita allocation to provinces and territories.

Juneau also emphasizes that effective project delivery requires an appropriate institutional structure, and—since infrastructure projects typically involve more than one level of government—he is strongly of the view that the responsible minister should be the minister for infrastructure, rather than one of his or her sectoral counterparts, who are less likely to have developed broad intergovernmental experience. Moreover, sectoral ministers are less likely, he believes, to have mandates that require them to think in terms of trade-offs of the sort necessary if scarce infrastructure investment funds are to be effectively and efficiently allocated. He concludes, therefore, that infrastructure departments, with dedicated ministers, are themselves a worthwhile investment. He concedes, however, that achieving the multilateral collaboration he deems necessary will be challenging given the failure of infrastructure ministers to develop the sort of intergovernmental apparatus enjoyed by some ministerial colleagues—for example, the ministers of finance. The variety of administrative structures utilized by the provinces and territories to manage infrastructure further complicates pursuing collaboration.

The final section of Juneau's chapter provides a case study of the contemporary federal approach to infrastructure, one spanning a four-year period beginning with the creation, in the 2001 budget, of the Canada Strategic Infrastructure Fund and the Department of Infrastructure (Infrastructure Canada). Drawing on his experience as the first deputy minister of the department, Juneau provides considerable insight as to how the fledgling department handled the problems and issues discussed in the earlier sections of his chapter.

In his paper, Jacques Caron outlines the main features of the Quebec government's ten-year infrastructure plan. Interestingly, Quebec is the only provincial government where infrastructure planning is the responsibility of the Treasury Board Secretariat and not of a dedicated infrastructure department (sometimes combined with the transportation department). The plan runs from 2015 to 2025 and is funded in two five-year periods, for a total of $88.4 billion. While this amount is deemed adequate to meet Quebec's ever-growing needs, the government continues to look for new ways of investing in the sector. The paper emphasizes and describes the twin goals of reducing the obsolescence of public infrastructure to maintain an adequate level of public services, and of fostering economic development. Caron makes distinctions among the concepts of asset maintenance, replacement, additions, and improvements.

Transportation and health and social services have the largest numbers of projects and the largest proportion of the funding. Caron includes tables on the number and funding of projects by sector. A chart in the paper displays priority-setting guidelines for maintaining services through asset maintenance and replacement, and for improving services. He then turns to a review of governance and decision-making for infrastructure projects. Planning and implementation are based on legislation and a "directive" that specifies the authorities that must be obtained by departments and the contents of the necessary documents. In addition, the stages at which Cabinet approval is required are specified. Caron concludes his chapter with a description of the government's commitment and approach to transparency in infrastructure spending.

Session 4 of the conference focused on various means—both traditional and innovative—of financing infrastructure at the different levels of government. The former federal deputy minister of finance, Scott Clark, examined the federal Liberals' election promise to finance infrastructure investments through budget deficits. He also explored the challenging issue of supporting infrastructure in Canada's highly decentralized federation. The paper by Kyle Hanniman of Queen's was also concerned with financing infrastructure investments by borrowing, but at the local level of government. Hanniman was particularly interested in the issue of centralization of local borrowing, a consideration that has gained significance as the interest-rate spreads paid by federal and sub-national borrowers (provincial and municipal) have widened. The third paper was presented by Michael Fenn, who, drawing on his previous experience as a former Ontario deputy minister and city chief administrative officer, discussed innovative ways of financing infrastructure investments.

Scott Clark's chapter discusses the federal Liberals' controversial election promise (and subsequent decision) to finance infrastructure by running budget deficits. The promise challenged the received anti-deficit wisdom of the Conservatives and the public, wisdom rooted in concerns about the global financial and Eurozone debt crises as well as Canada's own fiscal struggles in the 1980s and 1990s. But Canadians voted for the Liberals nonetheless, argues Clark, because of austerity's

evident failings in Canada, where the economy had yet to return to full potential, and in the Eurozone, where it had led to falling economic growth and worsening public finances. Consistent with recent advice from the International Monetary Fund, Clark recommends an expansionary fiscal policy focused on infrastructure spending, which, he argues, would boost the country's short-term aggregate demand and long-term productivity. Clark also supports the Liberals' decision to abandon the goal of deficit elimination for that of a stable or declining debt-to-GDP ratio. He suggests the optimal ratio is open to debate, but that it is essential that the Liberals' commit to their 31 percent ceiling for the sake of their fiscal credibility.

The final section of Clark's paper shifts from a general discussion about the relationship between deficits, infrastructure and macroeconomic performance to the more challenging issue of supporting infrastructure in Canada's highly decentralized federation. Most of Canada's core infrastructure belongs to the provinces and municipalities, which means the federal government needs to find creative ways to finance sub-national infrastructure. Clark discusses several possibilities, including replacing the ten-year New Building Canada Plan with a larger and longer-term federal-provincial infrastructure transfer program. Another option, which he has developed with Peter Devries, is federal financing or lending. This strategy would allow provinces and municipalities to take advantage of the federal government's lower interest rates. This could be done, according to Clark, though the establishment of a Crown Infrastructure Corporation.

In chapter 10, Kyle Hanniman also explores the issue of government borrowing, but from a local, rather than a federal perspective. He asks whether municipalities are wise to finance infrastructure by borrowing and whether the federal government, which could potentially borrow on their behalf, ought to do so. The answer, Hanniman says, is a "qualified yes." He argues that borrowing is an equitable and efficient means of financing long-term capital investments and that decentralization enhances the accountability of local fiscal decisions. He also notes that municipalities borrow responsibly. Their debts are a fraction of provincial liabilities; they assume virtually zero re-financing risk; they borrow at fixed rates; provincial laws prevent them from borrowing to excess; and they can step away from markets in a way that provinces—which borrow to finance healthcare and other sensitive services—cannot. These conditions suggest that observers ought to worry less about the rise of municipal debt, which has been modest, and more about the specificities of borrowing decisions, e.g., whether specific municipalities are borrowing too much or too little and whether they have the revenues to service debts and operate and maintain new assets.

If there is an argument for centralizing borrowing, Hanniman suggests it may be found in the heightened volatility that we have witnessed in global capital markets since 2008. This volatility has increased the spread or additional interest rate that provinces and municipalities pay over that paid by the federal government and has made it difficult at times for provinces and municipalities to borrow. Hanniman takes these developments seriously, but argues that the case for centralization is still

unclear. Not only could centralization distort local fiscal decisions, but it would also be difficult to implement given provincial authority over municipal finances and borrowing. Finally, while centralization would improve municipal credit conditions, current conditions are hardly oppressive. Problems of access have been short lived, and municipalities continue to borrow at extraordinarily low rates.

In chapter 11, Michael Fenn suggests that Ontario and other Canadian governments ought to find new and innovative ways to finance public infrastructure. Drawing on Australian and European examples, he recommends an explicit policy of "public asset recycling": funding infrastructure needs by selling stakes in governments' legacy assets. The value of these assets is considerable, argues Fenn, and they provide attractive investment opportunities for domestic investors, including public pension funds, many of which have been buying government assets abroad. Asset recycling also limits the need for borrowing and raising taxes and fees, major advantages in an era of tax aversion and rising debt-servicing costs.

But, to succeed, asset recycling cannot be done haphazardly. Certain policies and procedures need to be in place. These should include, Fenn suggests, the following: providing accurate estimates of the value and likely performance of the assets that governments plan to sell; hiring personnel capable of protecting governments' interests in public-private partnerships and other complex transactions; ensuring that proceeds from asset sales are used for near-term construction of new assets; establishing an arms-length regulator (one capable of balancing public and private interests) to oversee the private operation of public infrastructure; ensuring a steady pipeline of projects for potential buyers; recognizing investors' need for reasonable, risk-adjusted returns; avoiding overly complex, expensive and inconsistent transaction processes; and respecting the role and contributions of public-sector unions.

In organizing the 2015 State of the Federation conference, the program committee decided to include in the program the Institute's MacGregor Lecture. This endowed lectureship was established to honour the memory of Kenneth R. MacGregor, a former trustee of Queen's University and a Canadian who distinguished himself in both the public and private sectors, as the federal superintendent of insurance and as president of Mutual Life Assurance of Canada, respectively. Previous MacGregor lecturers were Robert Stanfield, Peter Lougheed, Allan Blakeney, Albert Breton, Gordon Robertson, Daniel Elazar, Roger Gibbins, Richard Simeon, and Alan Cairns. The Institute of Intergovernmental Relations was delighted that José Gómez-Ibáñez, the Derek Bok Professor of Urban Planning and Public Policy at the Kennedy School of Harvard University, accepted our invitation to deliver the 2015 MacGregor Lecture at the State of the Federation conference. For this MacGregor Lecture, Dr. Gómez-Ibáñez chose for his topic "Public-Private Partnerships in Infrastructure: Some Lessons Learned."

Dr. Gómez-Ibáñez's lecture, presented here as chapter 13, begins by noting that a common method of efficiently building and pricing new road infrastructure is through public-private partnerships (P3s). He then draws upon Canadian, American and Mexican P3 experience in roads and bridges to illustrate and support the views

set forth in his address. He argues that P3s have great potential for improving the delivery of infrastructure services, subject to two important caveats: first, that the partnership be designed primarily as a means of increasing efficiency in delivery of infrastructure services; and second, that great care be taken in the structuring of contracts between the public and private partners.

Dr. Gómez-Ibáñez supports P3s that make real gains in efficiency in the delivery of infrastructure services, and notes that P3s have improved the delivery of some infrastructure services compared to traditional procurement practices. Other important efficiency gains, he suggests, may be obtained by means of improved operation and maintenance of facilities on a life-cycle-cost basis, which would address some of the major problems noted in the Canadian Infrastructure Report Card. In addition, tolling roads offers the opportunity to improve the efficiency of infrastructure use through congestion charges—higher tolls during rush hours encourage shifting non-essential travel to off-peak times with spare capacity.

In contrast to his support for P3s that generate real efficiency gains, Professor Gómez-Ibáñez does not support P3s motivated primarily by the desire to tap into private capital markets, especially in the current period of low interest rates for public debt compared to expected average returns for private debt and equity. He also warns against using P3s for asset recycling—essentially using an asset sale or lease to capitalize future tolls on existing roads to close a municipal or provincial operating budget deficit. He also cautions that so doing may simply transfer the benefit of future tolls from future to present taxpayers. Finally, he stresses the importance of carefully drafting the contracts between public and private partners to reduce risks that unworkable terms for either party would require potentially controversial renegotiations. Since P3s are still something of a novelty, he praises the Canadian federal and provincial governments that have set up P3 advisory agencies with specialized expertise in structuring these contracts.

The penultimate session of the conference was directed to infrastructure investment and First Nations. The first paper, by Thomas J. Courchene, a former director of the IIGR, was concerned with "soft" infrastructure in the form of investments in governance structures. This paper has since been developed into a book that will shortly be published by IIGR, and will be presented later this year as a MacGregor Lecture. The second paper, i.e., chapter 14 by Greg Richard, an economist with Fiscal Realities, presented proposals for an Aboriginal Resource Tax (ART), the revenues of which would be used to fund infrastructure investments by First Nations. Richard noted that, if such a tax were generally accepted, it would obviate the need for repeated, protracted negotiations on the fiscal dimensions of virtually every land-claim negotiation.

As he notes at the outset, the paper was intended to promote discussion, and, since it involves federal, provincial, territorial and First Nations governments, it belongs to the sphere of multilevel governance. Richard's premise is that the fiscal benefits of resource developments will be significant and must contribute to the funding of First Nations infrastructure needs. Provincial revenues are not going to

be sufficient to fund those needs, which, of course, are a federal responsibility. A stable solution, Richard argues, must avoid the limitations that characterize revenue sharing or revenue agreements, which he outlines.

Rather than arguing in favour of some particular variant of an ART, Richard advocates the general principle of such a tax, one that would tap into the incremental revenue generated by resource developments on the traditional lands of a First Nation. Levied by First Nations, it would be used to fund their infrastructure needs. Such a tax would reduce the administrative burden on First Nations governments, reduce the cost and complexity of negotiations, provide economically and politically reliable revenues, and allow the funding of a broader range of projects. The author also argues that the tax would improve the investment climate by reducing the uncertainty currently associated with project-by-project financial negotiations. If accompanied by appropriately structured federal and provincial tax credits, the tax could be made revenue neutral to the resource developer.

The conference concluded with a session that compared elements of infrastructure investment in Canada with corresponding experience in the United States and in Australia. Only the paper discussing the former is available in this volume. The chapter by Martin Horak and Gabriel Eidelman examines the interaction of federalism and the provision of transportation infrastructure in the United States, and contrasts this with comparable experience in Canada. They begin by noting that both countries are highly decentralized federations in which subnational governments enjoy wide-ranging policy autonomy, and both share broadly similar geographies and development histories. They thus exhibit similarity of settlement patterns and infrastructure needs. Both countries also share a dominant political discourse around infrastructure, which is that there is a national infrastructure crisis that can only be resolved by increased federal aid. The balance of the chapter, however, is devoted to demonstrating that the similarities end there, both in terms of institutional structure and the historical role of the federal government in infrastructure funding and decision making.

Perhaps the most significant of the institutional differences that Horak and Eidelman note is the deliberate fragmentation of political authority in the United States, and the diffusion of authority within each level of government. The resulting multiplicity of sources of authority allows local interests a voice in national policy processes. While federal policies shape the scope of state and local infrastructure programs, decisions emerge from a bottom-up process in which political coalition-building at state and local levels largely determines the projects that become subject to filtration by the federal bureaucratic apparatus. The chapter provides a historical overview of how this process has functioned to shape US public infrastructure spending on surface transportation, a process in which the extensive and systematic federal involvement stands in stark contrast to the Canadian experience.

The analysis leads Horak and Eidelman to draw several comparative conclusions respecting the processes of infrastructure spending on surface transportation in the two countries. First, the American federal government has persistently played

a much larger role in infrastructure spending in this area than does its Canadian counterpart. Second, while most of the federal transportation funding in both countries takes the form of intergovernmental transfers, the linkage between revenues and expenditures is much closer in the United States. There, for example, gas tax revenues are deposited in the Highway Trust fund and used exclusively to fund transportation infrastructure, while in Canada, only some 40 percent of such revenues flow to the Gas Tax Fund, where they are used to support all kinds of local infrastructure development. Third, while the focus of transportation infrastructure expenditure has changed over time, such expenditures have consistently been considered a national policy priority by US authorities, one supported by well-established bureaucratic and governance structures. In contrast, Canadian federal government involvement in the sector has been both briefer and largely devoid of clear policy objectives. Moreover, the authors believe that in Canada federal policy capacity in the infrastructure sector remains low, with funding decisions largely devolved to provincial and local governments.

Horak and Eidelman also conclude that the American government's long-standing involvement in transportation infrastructure has shaped state and local institutions and decision processes in a manner that has no Canadian analogue. Finally, they note that the extreme degree of government fragmentation in the United States, particularly at the local level, means that proposed infrastructure projects may only be realized by means of a difficult, bottom-up process of coalition building. The resulting large number of potential veto points has no Canadian parallel.

The final chapter, by Richard L. Cole and John Kincaid, is unrelated to the conference on Canadian Federalism and Infrastructure, but is included because we believe it will be of interest to all students of federalism. It examines the nature and number of federalism courses being taught at the graduate and undergraduate levels in Canadian and US universities. Utilizing survey data obtained from political science department heads and federalism scholars in Canada and the United States, the authors show that undergraduate and graduate courses on federalism or intergovernmental relations (and interest in offering such courses) are widespread in both countries, but that such courses are taught more frequently in Canada than in the United States. However, in both countries, courses on Canadian and American federalism are more common than courses on comparative federalism. Canadian faculty reported significantly higher levels of student interest than US faculty in undergraduate federalism courses and were far more likely than their US counterparts to believe that such courses are considered "very valuable" by their department colleagues.

2

A BRIEF HISTORY OF INFRASTRUCTURE IN CANADA, 1870–2015

Herb Emery

Infrastructure has long been an important investment for economic prosperity, but of late the focus on infrastructure has been as a public investment to enhance the economy and its performance. Many Canadians would believe that this view arises from the public-goods nature of many infrastructure projects, this being the reason for the size of the government presence in terms of investment in roads and highways, public transportation, sewers, bridges, docks, and ports. Recent demand for infrastructure tends to be in the densely populated urban areas, where needs are alleged to be highest. The prominent role of government as a builder and operator of infrastructure is in fact a distorted view of infrastructure in Canada and the ways in which infrastructure can be financed. In this brief overview, I wish to show that since 1870 private owners and operators of fundamental infrastructure have been critically important and far more prominent than government as infrastructure developers. Further, historical infrastructure investments were "lumpy" and made "ahead of demand" to spur development and to exploit new communication and transportation technologies; in contrast, projects today tend to be following demand and expanding existing networks and technologies. Perhaps most provocative is the observation that arises: that the role of government as an infrastructure owner and operator reflects a political decision to not toll for infrastructure services rather than from economic necessity.

Infrastructure is a broad concept that describes the "basic physical and organizational structures and facilities (e.g., buildings, roads, power supplies) needed for the operation of a society or enterprise." But in the economics and policy literatures, infrastructure discussions are more narrowly focused on large capital-intensive natural monopolies such as highways, other transportation facilities, water and sewer

lines, and communication systems, often publicly owned. Gramlich observes that the focus is the "tangible capital stock owned by the public sector" (Gramlich 1994).

What do we know about *public* infrastructure capital *stocks* in Canada? Harchaoui, Tarkhani, and Warren (2004) show that since 1961, over 75 percent has been provincial and local infrastructure, that portion reaching over 90 percent in 2002. Consequently, the role of the federal government has been more in terms of supporting the finance of infrastructure controlled by the provinces and municipal governments. The fall in the federal share of public infrastructure from 25 percent in 1961 to 7 percent in 2002 has been the result of growth in the local share of infrastructure, which increased from 30 percent to 50 percent. The provincial government share fell only slightly from 45 percent to 42 percent.

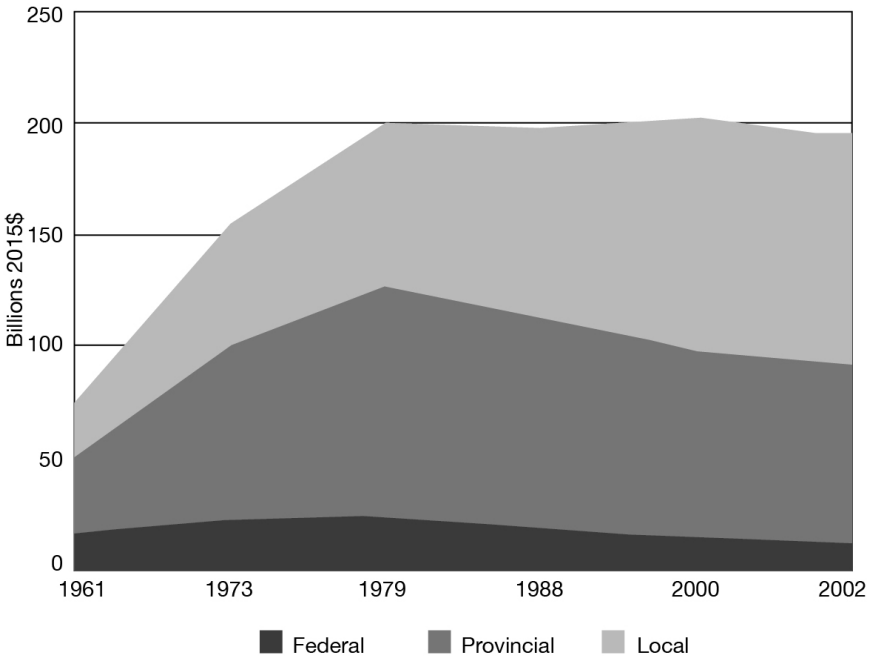
What is in the public capital stock has been consistent over the period of 1961 to 2002 and, surprisingly, not that different across levels of government (Harchaoui, Tarkhani, and Warren 2004). In 2002 the division among the three levels of government was as follows:

- local: highways and roads (45 percent), sewage treatment (12 percent), and sanitary sewers (17 percent)
- provincial: highways and roads (69 percent), bridges (10 percent), sewage treatment (4 percent), sanitary sewers (5 percent)
- federal: highways and roads (19 percent), trunk and distribution lines (9 percent), docks, wharves, piers, and terminals (13 percent), sewage treatment (7 percent), sanitary sewers (12 percent)

Complementing the misperception of the shifting importance of the level of government administering infrastructure is a mistaken perception of under-investment in infrastructure in Canada, most particularly in recent decades as local governments took on more responsibility. Figure 2.1 shows the total value of the country's stock of public infrastructure in 2015 purchasing power. The total stock has not changed in value since 1979, after strong rates of increase over the prior two decades. Further, the value has been held steady by local public administration filling the gap left by the lower values of capital stocks administered by the provincial and federal governments. In some cases, this pattern may reflect that provinces have transferred responsibility for highways and roads to local governments.

Figure 2.2 presents the data in Figure 2.1 in per capita terms. Obviously if the total value of public capital has not been increasing while population has grown, then the amount of public capital per person is falling. As the value of public capital under local administration has not fallen much, while the values for the federal and provincial governments have, it is tempting to interpret the figure as suggesting that the provinces and the federal government are not investing enough in public capital under the normative view that the value of the public capital stock in per capita terms should be non-decreasing. So, when we see spending plateauing or perhaps falling, driven by federal and provincial decreases in real spending on

Figure 2.1: Total Value of the Stock of Public Infrastructure in Canada, 1961–2002



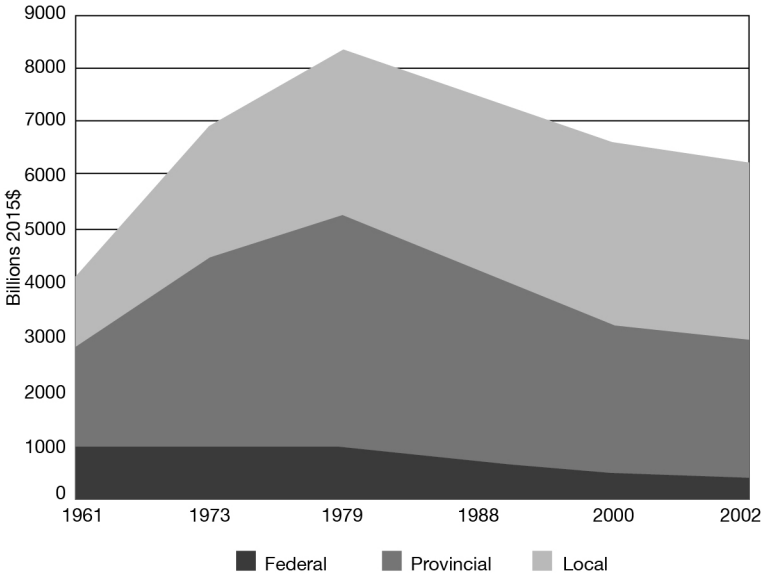
Source: Harchaoui, Tarkhani, and Warren 2004, Table 3.

public capital, it suggests an infrastructure crisis and an argument that the federal government should be doing more to ensure adequate infrastructure in cities.

The history of infrastructure more broadly defined suggests that focusing on publicly owned infrastructure may be misleading as a basis for public policy discussion. History shows that there is a reason for the shifting relative importance of the levels of government: where the growth is occurring it is changing, and so too are the purposes of the infrastructure. We should not, therefore, be surprised that rapid growth in infrastructure is followed by a subsequent decline in per capita values (lumpy and episodic investment); and that much of the broader national infrastructure has not required the same commitment of public spending and administration.

When we consider the broader stock of infrastructure in Canada, we find that much of it has been developed and operated by private interests. In other cases, previously publicly owned assets have been sold to private interests. This shift has occurred in cases where services can be "tolled," such that capital costs can

Figure 2.2: Value of Public Infrastructure Stock per Capita in Canada, Falling since 1979



Source: Harchaoui, Tarkhani, and Warren 2004, Table 3.

be recouped through pricing. Crown corporations operating as regulated natural monopolies have been the source of many of these privatizations.

Infrastructure supported but not necessarily financed by federal governments historically has reflected the standard argument for federal involvement in infrastructure, which is 'benefit spillovers" (Gramlich 1994, 1190). Citizens outside the jurisdiction where the investment occurred expected to receive some of the benefits of the investment, often by the opportunities it created. The investment in transportation and communication is necessary to open up hinterland to economic activity to provide producers access to international markets. Railways, canals, roads, pipelines, and ports spurred prairie settlement in the Wheat Boom era, and more recently are thought to be a precursor to northern development. In a different context, federal and provincial investment in research facilities has been instrumental in turning resources into reserves.

Federal and provincial government involvement has often been greatest in those situations where the project must be built ahead of demand in the first phase. The potential economic benefits to be captured by interests other than the developer and operator of the infrastructure project, or a preference by Canadians for where, how and when the project would be developed, required government involvement.

Government could play an important role in the project through arrangements to share the project's risk or to mitigate the downside risk of the private developer.

In a subsequent stage of development, higher levels of government support infrastructure investment that encourages integration of regional economies through communications and road networks, postal services, and radio and television broadcasting.

Infrastructure investment supported by provincial and local governments can have a purpose different than that of encouraging growth with spillover benefits. In some cases, like the Churchill railway in Manitoba, the goal is to support the province's retaining more of GDP from exports and to attracting capital to the local economy, potentially at the expense of the interests of the national economy. Or the investment may be to improve the amenity value of a locale, or to remove a disamenity such as sewage/waste/garbage.

History shows us that infrastructure investment is "lumpy" and episodic. Often the investment is spurred by new technology such as canals, railways, and then autos, or moving from telegraph to telephone to broadband Internet communications. With the shifts in transportation and communication possibilities, investments must typically occur all at once, since the technologies are network based or subject to other project indivisibilities. For example, Figure 2.3 shows investment spending on railways transport and telegraphs over two periods, from 1861 to 1930, when

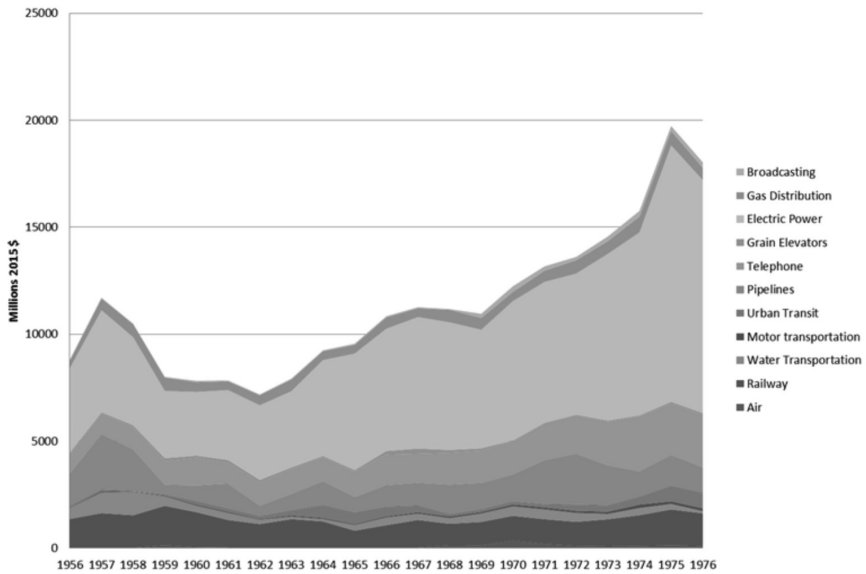
Figure 2.3: Investment Spending, Railways, Canada, 1861–1976

Source: Author's compilation.

rail transport was emerging as the new system, and from 1956 to 1976, when road transportation was emerging as an important mode of transportation. In 2015 purchasing power, the rail investments of the earlier period of western settlement was massive during the first decade of the twentieth century, as two transcontinental railways were completed, and branch-line construction followed a rapid pace of settlement in the West. With the collapse of the Wheat Boom after 1913, rail investment was still around $1 billion per year. In the latter period, investment in rail transport remained high in real terms despite the rise of roads and highways as the entering transportation investment. Over the period of rapid capital stock accumulation, shown in Figures 2.1 and 2.2, driven by investment in roads, that investment was on top of strong and steady investment in rail transportation.

Another perspective on the lumpiness of infrastructure investment, evident in Figure 2.4, comes from spending on public institutions. After World War II, the Baby Boom created a demand for schools. Changes in medical science and public funding for medical treatment drove an increased need for hospitals and advanced diagnostic technologies. The developing knowledge economy in Canada created the demand for more university-system capacity. Where hospital construction has shown steady growth, schools and university construction showed a particularly

Figure 2.4: New Construction in Transportation, Communication, Electric Power, Gas, and Water Utilities, 1956–1976



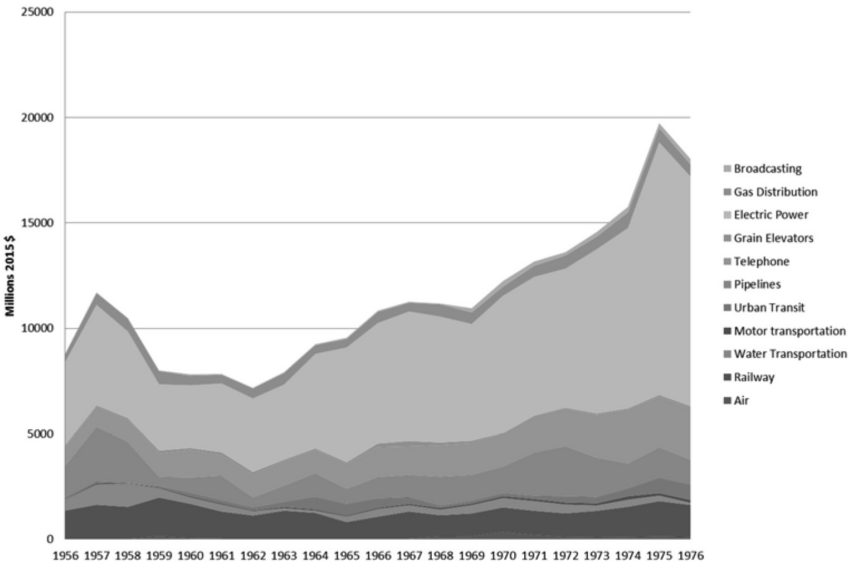
Source: Author's compilation.

large and compressed period of construction in the 1960s and early 1970s, driven by Baby Boomers reaching and leaving school age. For all of these categories, the issues going forward were on paying for the services using the capital and finding the funds for maintenance and replacement of capital.

Figure 2.5 provides further perspective on the broader picture of infrastructure. Roads, which are an important share of the stock of public infrastructure, are not a particularly large share of overall investment in Canada after 1956. As late as 1975, rail transport remains much larger than roads, but even rail investment is small compared to pipelines, telephones, and electric power.

The pro-cyclic characteristic of infrastructure investment in Canada is a further source of lumpiness in investment. Despite the appeal of infrastructure investment as a counter-cyclic economic stimulus, Gramlich (1994) observes that infrastructure investment is greatest when there is high economic growth. This pattern likely reflects that since much of the investment spending represented in Figure 2.5 is business investment—even if by Crown corporations and public utilities—strong expectations for the economy, high commodity prices spurring resource

Figure 2.5: New Construction in Transportation, Communication, Electric Power, Gas, and Water Utilities, 1956–1976 (Millions of Dollars, 2015 Purchasing Power)



Source: Author's compilation.

development, and governments with strong revenues and low debt all support the raising of funds for the project.

Interesting "Facts" But So What?

Roads, sewage treatment, and sanitary sewers are prominent in the federal, provincial, and local public capital stocks, particularly if we consider that the federal government provides grants for roads to other levels of government without necessarily having "ownership" of the capital. This similarity of public capital–stock composition suggests that much of the shifting relative importance of local public capital in the public discourse reflects that much of economic growth in Canada over the past few decades has been urban growth and development, and less around the hinterland resource development that was a more prominent focus for the federal and even provincial governments. In addition, many of the infrastructure investments that are demanded have localized benefits, often non-pecuniary (quality of life) as opposed to broader pecuniary benefits beyond the locale.

Consider a prominent policy discussion in Canada as to the adequacy of investment in infrastructure. Simple comparisons of rates of investment may be misleading because many projects were lumpy investments built ahead of demand. Once the capital was in place, subsequent investments were mostly incremental, for offsetting depreciation, effecting necessary improvements and some expansion. In addition, the investments created excess capacity for services until demand grew into the capital. So even qualitatively, more congested roads and networks than in the past are not necessarily a sign of infrastructure insufficiencies.

With ahead-of-demand investment in infrastructure, there may be "capital vintage" or similar issues over time. Capital may embody a technology that is not enduring, and so locations are "locked in" for some lifespan of the capital. To the extent that the finance of infrastructure is often tied to long-term service expectations of the capital owner through contracts or monopoly rights, dated vintages and technologies can persist, and disparities with jurisdictions with more recent investment become apparent.

There may also be problems of spatial misallocation over time that give a sense of a lack of capital. The scale and locations of investment based on historical needs and expectations at the time of investment may differ appreciably from needs today in that location. In some cases there may have been too much investment in infrastructure ex post. For example, Winnipeg did not become bigger than Chicago, as some optimists had predicted. In other cases, suburbanization and urban sprawl meant that schools built 1950 to 1970 in then new neighbourhoods are now in mature neighbourhoods with few children to attend; children are now more concentrated in the newer neighbourhoods.

In other cases societal norms change so that infrastructure that seemed adequate is suddenly lacking in terms of ideal services. For example, willingness to dump raw sewage into coastal waters or the Great Lakes system reduced the need for waste treatment facilities in some Canadian cities, but changing preferences of residents may result in this being seen as an infrastructure deficiency.

Financing Infrastructure

History shows that economic issues around the finance of infrastructure are surmountable. In a slowing economy, the demands for infrastructure seem heightened while the willingness and capacity of governments to take on debt to pay for the investment seems muted. This contrasts with the historical pattern that the big spends on infrastructure tend to be in boom times when expectations for future growth are high and there is considerable willingness and capacity to borrow and spend on capital projects.

Given the sizeable and sustained private investment in infrastructure, the challenges of financing public infrastructure being discussed in the policy literature are really where the investment will be using public borrowing or spending. There will be some appeal to the "public goods" aspects of public capital like schools, roads, sewage, and wastewater treatment, but it is not the case that the services produced from these capital stocks are non-exclusive or non-rivalrous in consumption: the use of public funds and public administration reflects a political preference for not pricing services for users and perhaps to redistribute the benefits of the services across identifiable groups of users.

In cases where, by political choice, projects are of a "natural monopoly" or a regulated-monopoly nature, infrastructure projects have proceeded often with little direct public investment but with public support provided through durable monopoly contracts with pricing/tolling of services.

The problems of publicly owned infrastructure are the political choices of how to finance them. With roads, Canadian governments at most levels choose not to toll and then appeal to the public-goods arguments to justify reliance on public monies. Highways, roads, and bridges can be tolled, and many are today. Ironically, it was the decision of governments not to toll highway services that distorted investment away from privately owned and administered rail transportation systems to publicly owned and administered road transportation financed out of tax revenues.

The same issue arises with the choice of "public ownership." Public transit is a curious situation since it can toll, but the political preference seems to be not to privatize or fully toll for the service. Public ownership and pay-as-you-go finance in turn are supported by cost sharing from more senior levels of government. This situation has several consequences for public infrastructure investment. Projects are reliant on voter support, which creates its own challenge for fully pricing a

project to include monies to offset future depreciation or to build to the ideal scale looking forward. Public investment is often sufficient for construction but is not accompanied by a commitment of revenues to support operation and maintenance of the project.

A look at the history of infrastructure in Canada ultimately reveals why the literature has been preoccupied with the challenges of public infrastructure investment. There are not that many challenges to having large-scale private infrastructure investment. Canada has had few problems achieving the necessary investments in vast networks of transportation and communications to support economic production and development. Private developers of infrastructure have made the investments in new technologies. But these cases are not being replicated in circumstances of urban growth where responsibility for investment rests with local governments assigned the responsibility for providing the services that its citizenry wants. A political preference for not fully pricing services to users or to privatize public capital stocks leaves investment decisions to the politics of the project rather than the economics. As Gramlich (1994, 1190) notes: "States and localities propose bond issues and voters decide whether to build the structure … voters are influenced by the financial and other terms of the deal, and these are set by governments and could be altered. The most important way this is done now is by federal grants."

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3

THE CANADIAN INFRASTRUCTURE REPORT CARD[1]

Chris McNally, Bill Ferreira, and David L. A. Gordon

Most Canadian citizens are largely unaware of the infrastructure that enables their community to function, except for perhaps the roads they drive on, the public transit they ride, or a park they enjoy walking in. Moreover, few of them grasp the networks that each involves and the planning needed to try to ensure their reliability (Hodge and Gordon 2014). Indeed, much of the infrastructure isn't visible to citizens, as in the cases of supplying water and dealing with sewage; or, when it is visible, as with electricity supply, it largely goes unnoticed.

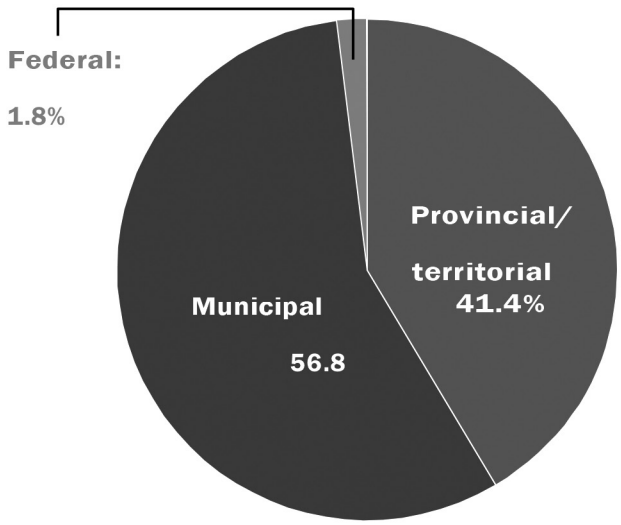
Until it fails.

Municipalities own many core infrastructure assets that are critical to the quality of life of Canadians and the competitiveness of the country. Almost 60 percent of Canada's core public infrastructure is owned and maintained by municipal governments (see Figure 3.1). Many of these assets were built during the "golden age" of infrastructure investment in the 1950s, but Canada's population has increased from sixteen million then to over thirty-five million in 2015. Over these past sixty-plus years, a substantial share of Canadian infrastructure custodianship has shifted (see Figure 3.2) from higher levels of government to municipalities, which have less access to revenue generation for construction, operations, and maintenance (Mackenzie 2013), as discussed in chapters 5 (Boadway and Kitchen), 10 (Hanniman), and 12 (Clark) below.

As recently as 2011, there was no comprehensive overview of the state of the infrastructure in Canada's municipalities—only a few partial reviews, based on

1. Portions of the text and many of the illustrations in this chapter were adapted (with permission) from the 2016 *Canadian Infrastructure Report Card*. The Canadian Urban Institute, led by Peter Halsall, was the project manager for the CIRC survey, analysis, and report.

Figure 3.1: Net Stock of Core Public Infrastructure by Level of Government, 2013



Source: Standing Committee on Transport, Infrastructure, and Communities 2015.

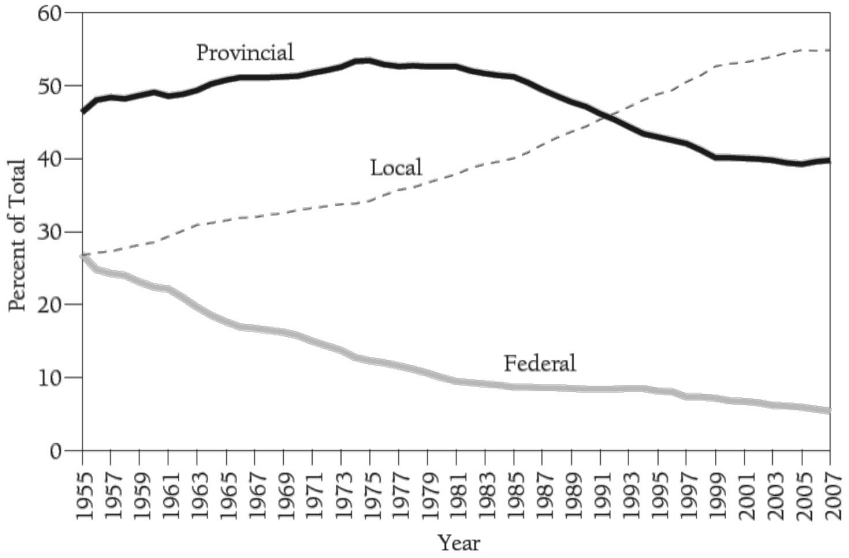
incomplete data and imperfect methods (McGill FCM 1996; SLDF 2004). The *Canadian Infrastructure Report Card* (CIRC 2012) was developed by a consortium of the Canadian Construction Association, Canadian Public Works Association, Canadian Society for Civil Engineering, and Federation of Canadian Municipalities to assess the health of Canada's municipal infrastructure and inform stakeholders about issues and trends. The objective was a rigorous, repeatable process that would be defendable, factual, and used to raise awareness, not for political advocacy. The CIRC is guided by an advisory board of sixteen national organizations associated with infrastructure (CIRC 2016, Appendix B).

The survey for the second edition of the *Report Card* was completed in 2015 and is the source for most of the discussion in this chapter.

REPORT CARD STUDY METHODOLOGY

The American Society of Civil Engineers provided a model for the CIRC with its *Report Card for America's Infrastructure*, issued on a regular basis since 1998 (ASCE 2013). The methods in the ASCE surveys were improved over the years (Mirza 2006) and informed the original 2012 CIRC, which examined drinking water, wastewater, stormwater, and municipal roads systems. The 2016 CIRC was

Figure 3.2: Changes in Ownership in Infrastructure Capital by Jurisdiction, 1955–2007



Source: Statistics Canada, CANSIM Matrix 031-0002.

expanded to also cover municipal bridges, buildings, transit infrastructure, and sports and recreation facilities.

The information used in the 2016 CIRC was collected using a voluntary survey distributed to the nearly 2,000 members of the Federation of Canadian Municipalities (FCM), which represent nearly 90 percent of the Canadian population. Information on transit infrastructure was collected through a separate survey with the help of the Canadian Urban Transit Association (CUTA).[2] The self-reported results provide qualitative and quantitative information on municipal infrastructure and its management.

The 2016 CIRC survey collected information on the municipally owned public infrastructure assets listed above. The survey did not collect data on other municipally owned infrastructure classes, including solid waste management, municipal

2. Most of the transit data was collected through a survey distributed to 130 transit operators across the country. The information was supplemented with data that the Canadian Urban Transit Association gathers annually from its members. A total of thirty-seven transit authorities responded to the transit survey, representing a serviced population of just over seventeen million (or about 67 percent of Canada's population serviced by transit) and representing 88 percent of all transit trips taken in 2013.

fleet and equipment (other than transit), affordable housing, energy systems, and information and communication technologies. As such, the total value of municipal infrastructure is not inclusive of all infrastructure assets.

The survey developed for the 2016 CIRC contained nearly 100 detailed questions on the inventory, condition, and management of municipally owned or leased infrastructure. A total of 120 municipalities responded to the survey, including ten regional municipalities and 110 single or lower-tier municipalities. These 120 municipalities represent a population sample of nearly twenty million Canadians, equivalent to 56 percent of Canada's total population. The survey results were extrapolated to the full Canadian population[3] to achieve the national picture presented below, with the exception of the transit data, which was only extrapolated to the serviced transit population of Canada.[4]

It is important to take a number of factors into account when reading the extrapolated results discussed below. First, the survey was entirely voluntary and did not target a particular sample of municipalities. Due to the high number of questions and the level of detail sought, it is reasonable to deduce that the participating municipalities have more mature infrastructure-management systems than the norm and as a result may be more proactive in managing and maintaining their infrastructure. Whereas the maturity of asset-management systems varies in communities of all sizes, small towns and rural municipalities faced more of a barrier to participation in this study, as staffing and budgetary limitations reduce the capacity for internal asset management.

It is therefore not surprising that large municipalities were overrepresented in the survey sample.[5] Large municipalities often have more capacity to answer very detailed survey questions on asset inventory, value, and condition. To account for the disproportionate representation of large municipalities, two separate extrapolations were undertaken: one for large municipalities, and one combining medium-sized and small municipalities.[6] These two extrapolations were then added together to

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3. The full Canadian population used to extrapolate the survey results is 35.7 million. See Statistics Canada, (2015).

4. Representing 88 percent of all transit trips taken in 2013; see footnote 2 above. Data from the thirty-seven respondents was extrapolated to the 2013–14 Canadian transit service population of 25.6 million.

5. Based on 2011 Census data, large municipalities represent 53 percent of Canada's population (see Statistics Canada, Population and Dwelling Counts, for Canada and Census Subdivisions (Municipalities), 2011 and 2006 censuses. The data collected from the survey represents 94 percent of the total population of large municipalities in Canada but only represents 13 percent of the total population of both small and medium-sized municipalities combined, resulting in datasets that are more representative of large municipalities.

6. The 30,000 population limit for small municipalities is quite high for rural and remote communities. The 2016 CIRC classifies municipalities as small, medium, and large,

provide a national picture. This approach produced a more accurate extrapolation as the inventory, condition, and value of municipal infrastructure per household differs by size of municipality.

The Yukon's Dawson, Mayo, and Whitehorse were the most northerly municipalities to participate in the 2016 CIRC survey. No municipalities from Nunavut, the Northwest Territories, or Aboriginal communities participated, so the survey results do not represent the extraordinary difficulties in providing modern infrastructure to small northern and First Nations settlements.

For the purposes of reporting average condition ratings, the most representative measure was used. For assets such as roads and pipes, survey questions assessed the physical condition by length of the asset. For other categories such as facilities and buildings, physical condition was assessed according to the replacement value of the asset. Using length of asset where applicable provided a more consistent and reliable means of comparing assets across municipalities. For buildings and facilities, it was determined that assessing physical condition by replacement value was the most representative indicator.

The calculation of the overall condition rating assigned to an asset category used weighted averages, based on the following system:

Table 3.1: Rating Scale for Asset Condition

- Very Good—fit for the future (weighted average 80–100%): Well maintained, good condition, new, or recently rehabilitated
- Good—adequate for now (weighted average 70–79.9%): Acceptable, generally approaching mid-stage of expected service life
- Fair—requires attention (weighted average 60– 69.9%): Signs of deterioration, some elements exhibit deficiencies
- Poor—increasing potential of affecting service (weighted average 50– 59.9%): Approaching end of service life, condition below standard, large portion of system exhibits significant deterioration
- Very Poor—unfit for sustained service (weighted average below 50%): Near or beyond expected service life, widespread signs of advanced deterioration, some assets may be unusable

consistent with Statistics Canada groupings, with one exception. Statistics Canada classifies small municipalities as having populations between 1,000 and 29,999, but the CIRC report includes all municipalities with a population under 30,000 as small.

The methodology followed was not designed to produce exact numbers but rather to provide a picture of the health of Canadian municipal infrastructure foundation and its value across the country.

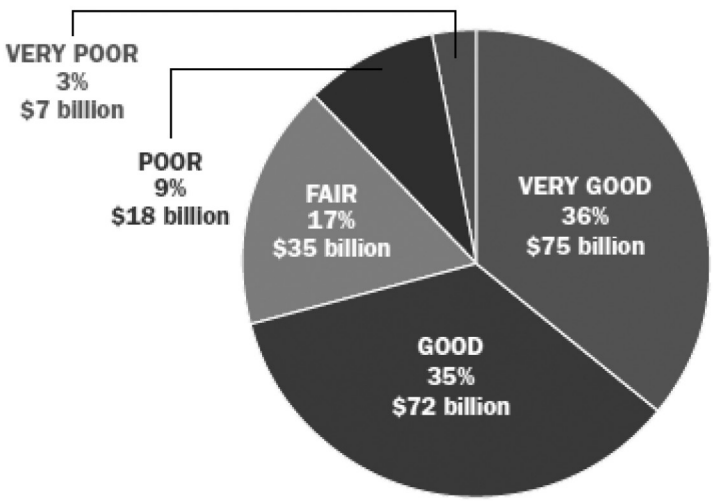
RESULTS BY SECTOR

Potable Water

The potable water infrastructure assets that were surveyed relate to the linear portion of potable water systems: large and small water distribution pipes, as well as non-linear assets: water treatment plants, water pumping stations, and water reservoirs.

The physical condition of potable water assets has an overall rating of Good: adequate for now (see Figure 3.3). Treatment plants and reservoirs have a Very Good average condition rating, while pumping stations, transmission and distribution pipes are rated in Good condition. The potable water production, storage, and distribution infrastructure in the system or network is Good, within acceptable condition.

Figure 3.3: Potable Water – Physical Condition Ratings by Replacement Value



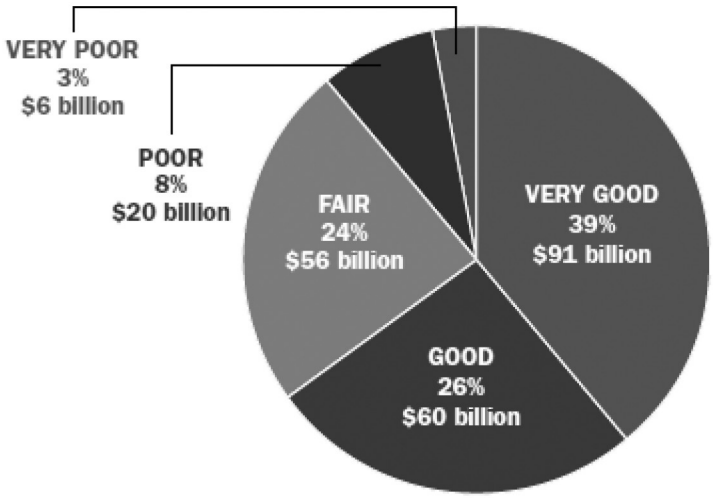
Source: CIRC 2016, 17.

Wastewater Infrastructure

The wastewater infrastructure assets that were surveyed relate to the linear wastewater collection system: large and small sanitary sewer pipes, trunk collection pipes, and forcemains, as well as non-linear assets: treatment plants, pumping stations, and storage tanks.

The physical condition of wastewater pipes has an overall rating of Very Good: fit for the future; well-maintained, good condition, new, or recently rehabilitated (see Figure 3.4), while the treatment plants and pumping stations have an overall rating of Good: adequate for now. The treatment plants, pumping stations, and storage infrastructure in the system or network are in Good (within acceptable) condition.

Figure 3.4: Wastewater – Physical Condition Ratings by Replacement Value



Source: CIRC 2016, 21.

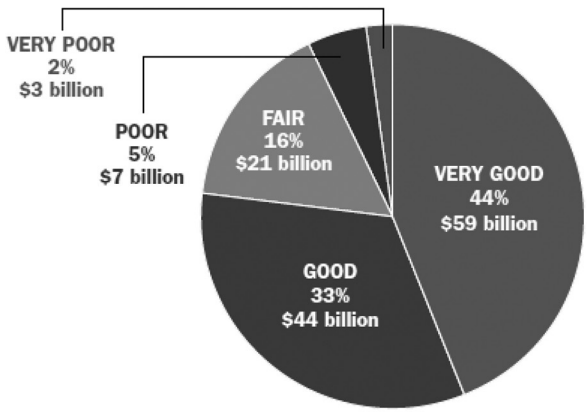
Stormwater Infrastructure

The stormwater infrastructure assets that were surveyed include the linear stormwater collection system: large and small local stormwater collection pipes, most culverts, trunk collection pipes, and non-linear assets: stormwater drainage pump stations and stormwater management facilities, such as ponds.

The physical condition of linear stormwater assets has an overall rating of Very Good: fit for the future; well-maintained, good condition, new, or recently rehabilitated.

The physical condition of non-linear stormwater assets has an overall rating of Good: adequate for now; within acceptable condition.

Figure 3.5: Stormwater Infrastructure – Physical Condition Ratings by Replacement Value



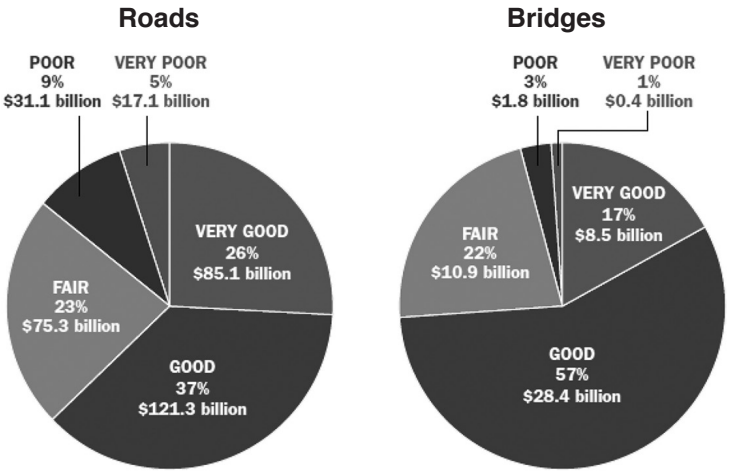
Source: CIRC 2016, 25.

Roads and Bridges

The road networks surveyed refer to highways, arterial roads, collector roads, local roads, and lanes and alleys. The asset categories of sidewalks and bridges (including bridges, big culverts, and footbridges) were also surveyed.

The physical condition of the road and bridge networks has an overall rating of Good: adequate for now; acceptable condition, within acceptable condition, with the exception of collector roads (Fair) and lanes and alleys (Poor). Across all municipalities that responded, 39 percent of roads and 28 percent of sidewalks were in Fair, Poor, and Very Poor condition, which was the weakest condition across core infrastructure types. And conditions in most asset classes were worse in the smaller municipalities, which have fewer resources at their disposal.

Figure 3.6: Roads and Bridges – Physical Condition Ratings by Replacement Value



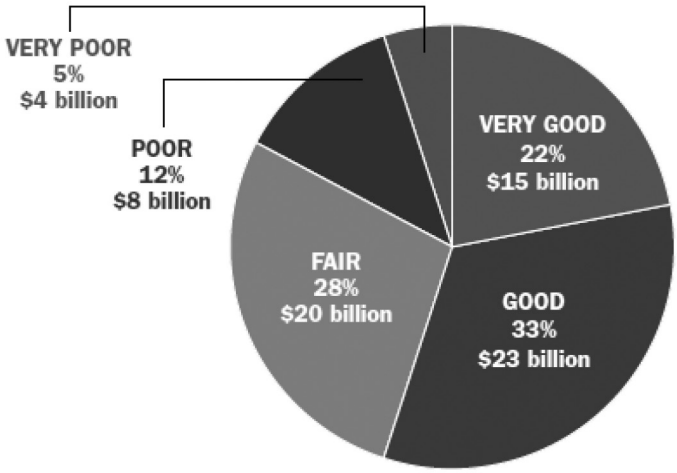
Source: CIRC 2016, 29.

Municipal Buildings

The municipally owned buildings that were included in the CIRC survey include administrative buildings, childcare/daycare centres, community centres and cultural facilities, fire stations, healthcare facilities, libraries, long-term care centres, paramedic stations, police stations, and shelters.

The physical condition of buildings has an overall rating of Good: adequate for now; within acceptable conditions. Long-term care facilities were in the best condition, while administrative buildings, paramedic stations, and police stations were generally only in Fair condition, requiring attention.

Figure 3.7: Municipal Buildings – Physical Condition Ratings by Replacement Value



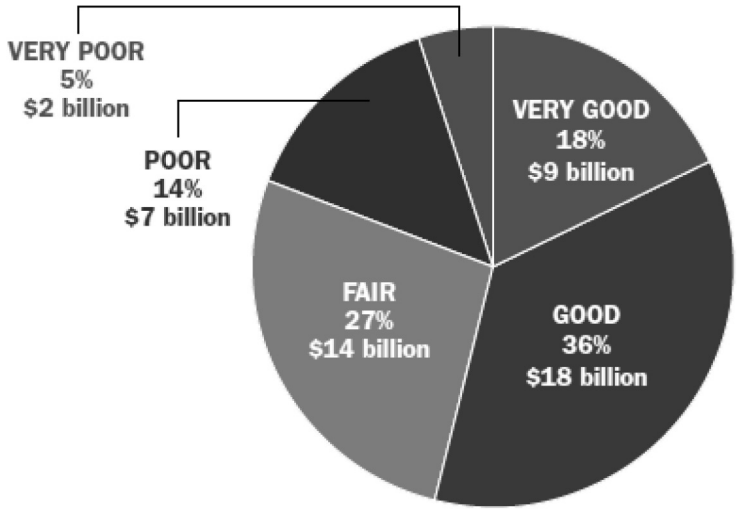
Source: CIRC 2016, 33.

Sport and Recreation Facilities

The municipally owned sport and recreation facilities that were included in the CIRC survey are community recreation centres/multiplexes, curling rinks, ice arenas, pools, senior centres, skateparks, ski hills, sports fields, stadiums, tennis courts, and youth centres.

The physical condition of sport and recreation facilities is Fair: requires attention; showing signs of deterioration, with some elements exhibiting deficiencies. The physical condition of sport and recreation facilities were assessed the lowest of all the asset categories included in the 2016 CIRC survey. Recreation centres and pools were in Good condition, while arenas and senior centres were in Fair condition and youth centres were generally in Poor condition across Canada, at risk of affecting service.

Figure 3.8: Sport and Recreation Facilities – Physical Condition Ratings by Replacement Value



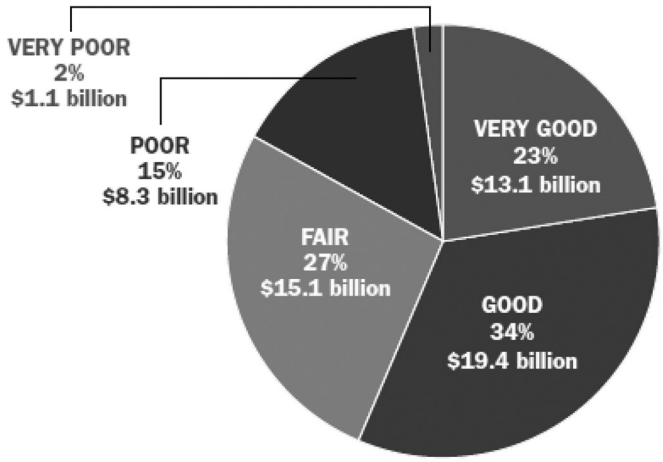
Source: CIRC 2016, 37.

Public Transit

The CIRC surveyed the following municipally owned transit assets: buses, streetcars, ferries, heavy railcars, commuter railcars, light railcars, mobile technology, security systems, rail signal systems, terminals, transit shelters, tunnels, exclusive rights-of-way, tracks, parking facilities, and service facilities. The range of transit assets is quite diverse, and more detail was gathered for this asset category to provide a better picture of the state of public transit assets.

The overall rating of physical condition of transit assets is Good: adequate for now; in acceptable condition. The bus fleet and technology systems were in Very Good condition across Canada, while fixed assets such as rail lines and tunnels were generally only in Fair condition.

Figure 3.9: Public Transit Infrastructure – Physical Condition Ratings by Replacement Value

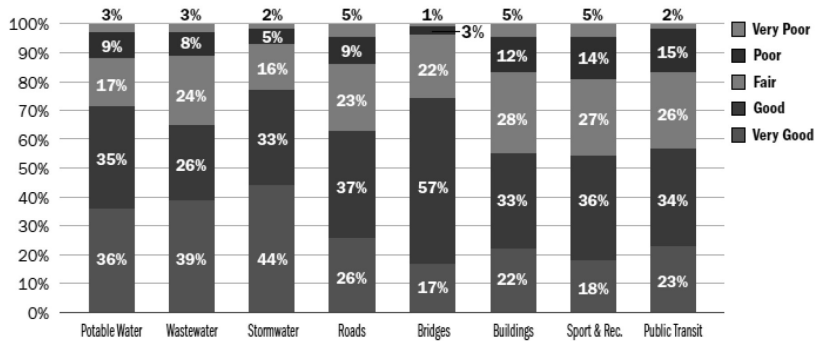


Source: CIRC 2016, 41.

NATIONAL PERSPECTIVE

One-third of Canada's municipal infrastructure is in Fair, Poor, or Very Poor condition, increasing the risk of service disruption. The survey asked municipalities to qualitatively assess their infrastructure according to a five-point rating scale ranging from Very Good to Very Poor. Nearly 35 percent of assets are in need of attention. Assets in Fair, Poor, and Very Poor conditions represent a call for action. Survey results demonstrate that roads, municipal buildings, sport and recreation facilities, and public transit are the asset classes most in need of attention. Figure 3.10 provides a summary of the physical condition ratings for the sectors covered in the CISC.

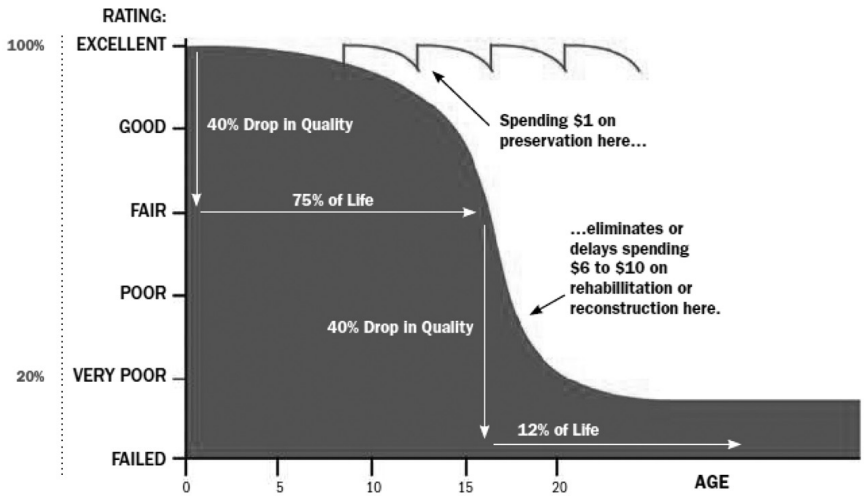
Figure 3.10: Summary of Average Physical Condition Rating



Source: CIRC 2016, 10.

The estimated replacement value of the infrastructure that was in Very Poor and Poor condition was estimated to be $141 billion when extrapolated across the country, with roads accounting for one-third of the total (see Figure 3.11). The problems can be expected to get worse in the future because reinvestment levels are below what is required to maintain the assets in every class of infrastructure.

Figure 3.11: A Penny Today or a Dollar Later: Example of Asset Deterioration Curve (Roads)



Source: CIRC 2016, 11; Galehouse, Moulthrop, and Hicks 2013.

CONCLUSIONS

Increasing reinvestment rates will stop the deterioration of municipal infrastructure. The 2016 CIRC found that rates of reinvestment are lower than the targets recommended by asset-management practitioners. The rate can vary based on factors such as the age of the infrastructure, the level of service, and risk tolerance. The values provided are based on the experience of municipal asset-management practitioners and are intended to be informative in nature. Roads and sidewalks, storm water, and sport and recreation infrastructure presented the largest gaps in terms of current and target rates of reinvestment, with water systems–related facilities not far behind. Tables 3.2 and 3.3 on the next page demonstrate the gap between current and target reinvestment levels. Continuing down this path will result in a gradual decline of physical condition levels that will affect municipal services.[7] When contrasted with target reinvestment rates,[8] current levels of reinvestment in municipal infrastructure are clearly inadequate.

Increasing reinvestment rates will save money in the long term**.** Without an increase in current reinvestment rates, the condition of Canada's core municipal infrastructure will gradually decline, costing more money and risking service disruption. For example, Figure 3.13 demonstrates that when roads, as is typical for many assets,[9] are allowed to deteriorate below a Fair condition rating, the rate of deterioration and reinvestment costs both increase substantially. Investing in preventive maintenance and regular repair will prolong the asset service life, avoiding premature and costly reconstruction and service disruption (Galehouse, Moulthrop, and Hicks 2003).

Building for today's communities and tomorrow's Canada requires long-term planning. Survey results demonstrate that if current rates of reinvestment do not

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7. The 2016 CIRC survey collected data on the current value, the estimated replacement value, and projected annual renewal budget (for rehabilitation, reconstruction, or replacement) for most asset categories. Average reinvestment rates were then derived from the data.

8. There are currently no formal industry-recognized target reinvestment rates. The rates vary across responding municipalities, based on factors such as the average age of the infrastructure, the level of maintenance expenditures, risk tolerance, and available infrastructure funding. Municipal asset-management practitioners in Canada are working to develop tools that municipalities can use to better establish target reinvestment rates for each asset type (rehabilitation, reconstruction, or replacement of infrastructure). The values provided in Figure 3.12 are based on the experience of municipal asset-management practitioners providing advice to the CIRC PSC and are therefore intended to be informative in nature.

9. Though only the deterioration curve for roads is shown here, Appendix E in CIRC 2016 provides a more detailed illustration of infrastructure system/network deterioration over its service life.

Table 3.2: Summary of the Physical Condition of the Infrastructure Studied, by Replacement Value, Extrapolated to the Entire Country

Infrastructure	Extrapolated Replacement Value of All Assets	Assets in Very Poor and Poor Condition	Assets in Fair Physical Condition	Anticipated Condition Based on Reported Reinvestment Levels (Improving, Stable, Declining)
		Replacement Value	Replacement Value	
Potable Water	$207 billion	$25 billion (12%)	$35 billion (17%)	Declining
Wastewater	$234 billion	$26 billion (11%)	$56 billion (24%)	Declining
Stormwater	$134 billion	$10 billion (7%)	$21 billion (16%)	Declining
Roads	$330 billion	$48 billion (15%)	$75 billion (23%)	Declining
Bridges	$50 billion	$2 billion (4%)	$11 billion (22%)	Declining
Buildings	$70 billion	$12 billion (17%)	$20 billion (28%)	Declining
Sport and Recreation Facilities	$51 billion	$9 billion (18%)	$14 billion (27%)	Declining
Transit	$57 billion	$9 billion (16%)	$15 billion (27%)	Unavailable
Total	**$1.1 trillion**	**$141 billion (12%)**	**$247 billion (22%)**	
Replacement Value per Household	**$80,000**	**$10,000**	**$18,000**	

Source: CIRC 2016, 12.

Table 3.3: Target Reinvestment Rates vs. Current Reinvestment Rate

Infrastructure	Lower Target Reinvestment Rate	Upper Target Reinvestment Rate	Current Reinvestment Rate
Potable Water (linear)	1.0%	1.5%	0.9%
Potable Water (non-linear)	1.7%	2.5%	1.1%
Wastewater (linear)	1.0%	1.3%	0.7%
Wastewater (non-linear)	1.7%	2.5%	1.4%
Stormwater (linear)	1.0%	1.3%	0.3%
Stormwater (non-linear)	1.7%	2.0%	1.3%
Roads and Sidewalks	2.0%	3.0%	1.1%
Bridges	1.0%	1.5%	0.8%
Buildings	1.7%	2.5%	1.7%
Sport and Recreation	1.7%	2.5%	1.3%

Source: CIRC 2016, 11.

change, the condition of Canada's existing municipal infrastructure will decline. Municipalities need to adopt more strategic asset management practices (CIRC 2014) and coordinate their infrastructure, transportation, environmental, and land-use planning (Hodge and Gordon 2014). In addition, a long-term plan is needed to ensure that Canadians can continue to rely upon essential public services without disruption. Such a plan would also allow municipalities to prepare for projected population growth, keep up with technological innovation, and deal with the increasing impact of extreme weather events (Baird 2010; Page and Khan 2016).

According to survey results, the total value of core municipal infrastructure assets is estimated at $1.1 trillion dollars, or about $80,000 per household.[10] Municipal infrastructure gets people and goods moving, provides safe drinking water, handles waste, creates spaces for sport and recreation, and helps protect Canadian homes against flooding and other natural disasters. The delivery of these essential public services is reliant on a strong foundation of municipal infrastructure. This foundation enables communities and local businesses to grow, and ensures Canadians can lead safe and healthy lives.

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10. For households in large municipalities (over 100,000 population), this cost is $73,000, increasing to almost $85,000 for households in small and medium-sized municipalities. This discrepancy is due to the large urban centres' higher population density, which means that assets are extended over shorter distances and the costs are shared by more people.

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4

FINANCING REGIONAL PUBLIC TRANSIT IN ONTARIO: THE CASE FOR STRENGTHENING THE WICKSELLIAN CONNECTION

Enid Slack and Richard Bird

Infrastructure finance has recently been much discussed.[1] In Ontario, where much investment in infrastructure is needed simply to keep the existing structure running,[2] perhaps the most discussed infrastructure issue has been the improvement of rapid transit in the Toronto metropolitan region.[3] We first present a brief argument about the importance of establishing what we call the Wicksellian Connection—a clear and meaningful linkage between expenditures and revenues—essentially because unless it is decided who is going to pay and how, we cannot sensibly decide what should be done.[4] In the case of rapid transit in the Toronto region, however, although

1. In addition to the present volume, see Alm (2015) and Frank and Martinez-Vazquez (forthcoming) and the extensive international literature cited therein.

2. In 2007, the Federation of Canadian Municipalities (FCM) estimated an infrastructure deficit of $123 billion for Canada (Mirza 2007). This estimate was derived from a survey of municipalities and represents what municipal governments identify as their infrastructure funding needs. As Boadway and Kitchen (this volume) note, such estimates of the infrastructure deficit do not consider what the real deficit would be if municipalities priced or taxed for their services correctly.

3. See, for example, Metrolinx (2013), Transit Investment Strategy Advisory Panel (2013), and Toronto Region Board of Trade (2013).

4. One cannot do a sound cost-benefit analysis of any investment project without first determining how the project is to be financed (Bird 2005). Indeed, one cannot neatly separate the question of how to finance government in general from the question of how the fi-

there is no shortage of more or less elaborate plans as to what should be done, or at least what some people think should be done, there has been no agreement on who can or should pay for whatever is to be done. In the second section of the paper, we review the major proposals that have been put forward to date and find that few give sufficient attention to the importance of establishing a clear linkage between what is to be done and how it is to be paid for to ensure that what is finally done is financed in a way that will meet even the barest tests of efficiency, equity, and accountability. In the last section we consider some ways in which this circle may be closed, at least in part.

LINKING TAXES AND EXPENDITURES: THE WICKSELLIAN CONNECTION

People don't like paying taxes or fees for public services. To some extent, attitudes to taxation depend on what potential taxpayers think will be financed. People are broadly right in thinking that what they pay and what they get are related, although the connection between the two is seldom clear and not always direct. If one aim of public policy is to ensure that the public sector operates efficiently, it is important to establish as clear a linkage as possible between expenditure and revenue decisions at the margin. As Richard Musgrave (2000, 101) noted, to provide "public goods in an efficient and also just manner … in the absence of an omniscient referee … a mechanism for preference revelation [is needed with] tax and expenditure decisions … joined as they should be, rather than pursued as independent parts of the budget." The linkage between expenditure and revenue decisions, which Breton (1996) labelled "the Wicksellian Connection" in honour of the Swedish economist who first set out this argument in 1896, is especially important when decisions are made by different levels of government to ensure that all are properly accountable for their actions. As has been said elsewhere, "Promoting the coincidence between the three circles of budgetary policy: those who decide, those who benefit, and those who pay [is needed] … to improve the responsiveness and accountability of politicians and bureaucrats and to ensure closer correspondence of the basket of publicly provided goods and services with the preferences of beneficiaries and taxpayers in

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nance is to be spent, especially when dealing with sub-central governments (Bird and Slack 2014). Of course, as Boadway (2012) makes clear, there are excellent analytic reasons why economists generally analyze taxes and expenditure decisions separately, implicitly assuming that the two are not directly connected. However, when it comes to large location-specific investment projects financed in whole or part by governments with different territorial responsibilities, assuming that the investment and financing decisions can or should be made separately may lead to poor decisions (Bahl and Bird 2013).

the various … jurisdictions."[5] In addition to facilitating the achievement of efficiency and accountability, linking expenditure and financing should also promote equity by ensuring that what is done and how it is financed are sufficiently fair to be acceptable within the existing representative institutional democratic structure.[6]

Just as appropriate use of the benefit principle in this sense of linking taxation and spending—the Wicksellian Connection—is central to achieving the aims of fiscal decentralization, charging for public services and earmarking revenues to the services provided is central to a sound local finance system. In such a system, expenditure responsibilities are matched with revenue resources, revenue capacities matched with political accountability, and benefit areas matched with financing areas. This approach in effect treats local (and regional) governments like "firms" producing and selling services to their customers.[7] But local governments operate in many different institutional settings and offer some services that are essentially "private" in nature (that is, consumed by specific persons), others that are local public goods, and still others that spill over jurisdictional boundaries to varying degrees. Local governments often have little discretion with respect to either the services they offer or how they pay for them. The net result is that in the end many local public services are not paid for either by local residents or by the (overlapping but seldom identical) group of direct beneficiaries. Instead, they are usually financed by a motley set of transfers, general taxes (some exported), and fees (almost never set at economically efficient levels). The result is that those who pay seldom see what they get for what they pay—and sometimes they do not get anything—while those who benefit are usually equally unaware that they are getting far more than they pay for.

Because most services for which local governments are responsible are assigned by the province in Canada, all local government finance from all sources is in a sense earmarked to those responsibilities. In addition, some transfers from both provincial and federal governments are also earmarked for specific areas and, of

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5. The quoted passages come from Bird et al. (2003, 351) although the order of the sentence has been changed. Olson (1969) called a similar argument the "fiscal equivalence" principle.

6. We do not discuss here the always contentious question of how "democratic" the decisive institutions are or the even more contentious question of whether the politically acceptable decisions may or may not accord with the degree of redistribution desired by particular groups or individuals. But we do assume, without discussion, that any desired degree of general (or territorial) redistribution can and should be adequately achieved through the appropriate design and implementation of the general tax-transfer system structure rather than by distorting infrastructure finance and investment decisions.

7. Tiebout (1956) first treated localities as competing firms. However, his local governments sold only pure public services, enjoyed equally by all local residents and only by them, and operated in an extremely artificial institutional setting (Bewley 1981).

course, income from user fees is often specifically allocated to the related services. However, Canadians have paid surprisingly little attention to the basic idea that local governments should charge for services provided whenever possible, earmark the revenues received to the services for which they are paid, and—barring "externality-related" subsidies from outside—spend only those amounts on those services. Nonetheless, since it is clearly important to strive for efficiency in local public finance, not least when it comes to financing major infrastructure projects like urban rapid transit, the Wicksellian approach deserves much more attention than it has received in recent years.[8]

From this perspective, the optimal way to design a local tax system is, first, to determine the desired size and nature of local expenditures, and then to put in place a tax (and transfer) system that faces local decision makers, taxpayers, and potential users of services with incentives that will lead them to choose to finance precisely that package of expenditures. At present, however, decisions on the two sides of the local budget are usually made independently, often with relatively little local input. Indeed, in Canada, both the size and nature of local expenditures and local taxes are largely determined in practice by provincial decisions. As a result, not only are local expenditures little influenced by local revenue policy but accountability at the local level is often both confused and confusing.

How should local services and, in particular, transit be financed? The place to start is with user fees, a unique and valuable revenue 'tool' that provides not only funds to supply services but also information on which services should be provided, in what quantity and quality, and to whom. Good user charges improve the efficiency with which scarce public resources are employed, thus giving people more of what they want (and are willing to pay for) rather than what someone else decides they should have. The first rule of sensible local finance is thus: "wherever possible, charge," because good user charges not only produce revenue but also promote economic efficiency and improve the well-being of society as a whole. When people are not explicitly charged for consuming a service, the implied value they will rationally attach to the last unit they use is approximately zero. Consequently, more is consumed (and demanded) than people would be willing to pay for if they were faced with the real costs of the service. Under-pricing—the free (or subsidized) provision of services—thus results not only in over-consumption but often also in subsequent ill-advised investment. For example, when subsidized roads become crowded, the political pressure to widen them becomes greater. Over-investment in under-priced facilities leads to inefficient use of scarce public resources. It is the "black hole" of local government finance—something goes in, but nothing of equal value to society comes out. Good user charges can avoid such waste.

8. For a more general exploration of this issue in the rather different context of developing countries, see Bird and Slack (2014).

To be efficient in allocating scarce investment resources, public policy should therefore allocate costs associated with a given benefit as much as possible to those individuals, firms, neighbourhoods, and groups that enjoy the benefit (Bazel and Mintz 2014). Where user fees cannot be charged, local revenues to finance the infrastructure and current expenditures needed to provide services should to the extent possible be collected only from local residents, preferably in relation to the perceived benefits they receive from local services. Revenues from other sources (including local business activities) should similarly match the benefits they receive from local services.

In the case of regional transit investment, the main direct beneficiaries are obviously drivers and transit users. However, businesses, property owners, and visitors may also benefit to varying degrees. Transit users benefit directly from an enhanced transit system. The fares they pay should be based on marginal cost, appropriately defined in terms of the economic (opportunity) cost of the resources consumed in providing the service and varying by such relevant factors as location and time of day. Drivers also benefit directly from a more efficient transit system because it potentially takes other drivers off the road and reduces congestion, thus generating benefits like those yielded by an improved road network. The most appropriate revenues to match benefits and costs for drivers would be through direct charges for the use of roads, such as highway tolls and parking charges. Ideally, such charges—which can now technically (if not often politically) be feasibly imposed through electronic registration of vehicle use—should be adjusted to cover the social marginal cost of road use (e.g., varying with such factors as time of day and location). In the absence of efficient pricing systems, cruder instruments like fuel taxes, vehicle registration fees, and parking charges can be used to achieve at least a rough linkage between benefits and costs for drivers.

Businesses also benefit from being able to transport and receive goods and services at reduced real cost (even after adjusting for the higher costs borne by truck transport), as well as less directly through improved access to customers and by being able more easily to attract skilled workers who find it easier to get to work. Parking fees for business-provided parking spaces might be one way to link benefits and costs for businesses; development charges could be another. Neighbourhoods and property owners may benefit from increased property values because of better access to transit. Property taxes, development charges, and land-value-capture levies would be appropriate to pay for these indirect benefits. Visitors benefit from being able to get around and access tourist sites more easily. To some extent, these benefits might be captured directly through transit fares and parking charges and indirectly through property taxes and business-related benefit charges. Finally, in addition to possible indirect benefits to residents from reduced congestion and more environmentally sound, compact development, there may be regional or even national (and world) benefits from lower greenhouse gas (GHG) emissions. Some of the costs of providing infrastructure that yields such benefits might perhaps also be recaptured through more general taxes and transfers.

A major local financing issue currently facing the Province of Ontario is how to finance the regional public transit system in the Toronto metropolitan area. Unfortunately, as we show in the next section, the recent discussion of this issue provides an excellent illustration of the results of neglecting the importance of the Wicksellian Connection. Although many of the reports surveyed below talk about the importance of linking benefits and costs, few recommend the best way of doing this—improved transit fares and highway tolls—and most attempt to shift far too much of the cost to taxpayers who may not receive any visible, measurable, or significant benefits from such expenditure and may hence, not unreasonably, be reluctant to pay for it. As we note in the concluding section, although advances in technology make a more rational local finance system more achievable than was true in Wicksell's (or even Musgrave's) time, it remains far from clear that the people (or politicians) in Ontario—or in Canada as a whole—are yet willing to face up to the economic realities of local finance brought out in this discussion.

FINANCING REGIONAL PUBLIC TRANSIT IN ONTARIO

> In no area … is economic thinking on pricing, and even the administrative feasibility of correct pricing more developed [than with respect to transportation]; yet it is probably safe to predict that the Canadian transport system will … continue to be as irrationally priced, and consequently over-expanded, in the future as in the past (Bird 1976, 92).

Economists certainly have no claim to be prophets: sometimes, however, we may get it right. As several major studies of how to finance regional public transit in Ontario have again underlined, no obvious progress has been made in Canada in recent decades towards the goal of financing transportation more sensibly. In short, little attention has been paid to the importance of establishing a stronger Wicksellian Connection between spending and taxation in this area.

Similar problems are being currently dealt with in a variety of ways in several metropolitan regions in North America. In the United States, for example, special ballot initiatives have been used to gain public support for tax increases in the form of dedicated revenue tools for specific transportation projects. For example, the Los Angeles County Metropolitan Transportation Authority (MTA) levied two general sales taxes dedicated to transit, each one-half of 1 percent, which were approved by voters through special ballot initiatives in 1980 and 1990. In 2008, a further ballot initiative was supported by a majority of voters for another half-cent sales tax dedicated to funding the borrowing for specific new transportation investments (IMFG 2012). Similarly, after several earlier failures, ballot initiatives in 2000 and 2006 in Salt Lake City succeeded in imposing a quarter-cent sales tax dedicated to transit expansion (ibid.).

In Canada, the British Columbia provincial government held a referendum in Metro Vancouver to gain support for a 0.5 percent increase to the provincial sales tax in Metro Vancouver to be dedicated to a transportation and transit plan put forth by the mayors' council. The results (61.7 percent No, 38.4 percent Yes), although no doubt in part reflecting the failure of the provincial government to present the Yes case clearly or well (Mason 2015), show the lack of support for tax increases to pay for transit in this country. Many who live in urban areas appear to want more and better transit, but neither they nor anyone else appear willing to pay for it.

On the other hand, at least some of the proposals in the various reports that have been recently considered in Ontario, as summarized in Table 4.1, can, as we show, be read as demonstrating that people are aware not only of the linkage between revenue and expenditure but also to some extent of the potential effects of pricing. At some level, we recognize that as a community we must pay for what we get, even if we seldom agree on precisely who should get what and who should pay for what. Unfortunately, as we discuss below, the Ontario case also suggests strongly that decisions on such matters—both on what is suggested and what is seriously considered—continue to be made essentially on other grounds, even though it is not always clear exactly what those grounds are.[9]

The Greater Toronto and Hamilton Area (GTHA) contains about seven million people—half the population of the Province of Ontario. The region encompasses two single-tier cities (Toronto and Hamilton) and four regional governments with twenty-four lower-tier cities, towns, and townships. Each government is responsible for local public transit, as well as most roads and highways within its boundaries. The provincial government is responsible for major highways (except for one privately owned highway financed by vehicle usage fees). GO Transit is a regional public transit service for the GTHA; the Toronto Transit Commission (TTC) in the City of Toronto is the largest local transit system in the region.[10]

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9. We do not discuss here one of the principal problems in rationally funding and pricing public transit—the extent to which much of the use of roads by private vehicles is subsidized—in part because this issue has never really been discussed sensibly in Canada in the context of the regional transport problem. Moreover, whatever the facts may be, experience in Toronto in recent years (see note 21) suggests that taxing people's cars may perhaps be even more politically toxic than taxing their houses. More optimistically, as Duncan et al. (2014) have recently suggested, people's attitudes on such matters may change as they come to understand better how the real costs associated with underpriced road use may affect their own well-being. For a recent Canadian review of attitudes to road pricing, suggesting that such understanding may be increasing, see Kitchen and Lindsey (2013).

10. GO recovers 80 to 85 percent of its operating revenue from the fare box, and the provincial government subsidizes the remaining operating costs. The province is also responsible for the base capital funding for rehabilitation and replacement and provides funding for capital costs associated with growth and expansion. Contributions are also made by

In 2006, in response to increasing concern about the growing negative impact of congestion on the economy, the environment, and the quality of life in the region, the provincial government created a regional transit agency now known as Metrolinx to improve the coordination and integration of all transportation modes in the region, with the mandate of providing an integrated multi-modal transportation system for the GTHA.[11] Since Metrolinx is a provincial agency governed by a presumably "expert" board appointed by the provincial government, no local politicians or officials are directly involved in its decisions. Moreover, the agency has no taxing or borrowing powers. These are serious defects from the perspective of ensuring efficient and accountable outcomes.

The Big Move

Two years after it was created, Metrolinx (2008) produced a Draft Regional Transportation Plan ("the Big Move") to address traffic congestion in the GTHA through a major program of investments in transit and road infrastructure. The capital cost of implementing the plan was estimated to be $50 billion over twenty-five years. Metrolinx was also directed to develop an investment and funding strategy to support the implementation of the Big Move. Five years later, it did so (Metrolinx 2013). By this time, $16 billion had already been committed by all three levels of government (though primarily by the province). Of the remaining $34 billion, 75 percent would fund regional transit capital construction and financing costs, ongoing rehabilitation and replacement costs, and the Metrolinx share of operating and maintenance costs. The remaining 25 percent of investments would be used for local roads and transit (up to 15 percent, to be matched by local contributions), improvements to the provincial and municipal controlled access highway network (up to 5 percent), and various other transportation initiatives such as walking and cycling infrastructure, fare integration, mobility hubs, urban freight movement, intelligent transportation systems, and user information systems (up to 5 percent).

As part of its investment strategy, Metrolinx applied four "principles" on how to pay for the projects set out in the Big Move. One was the very Wicksellian-sounding

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the federal and municipal governments, but these amounts vary from year to year (Metrolinx 2012). With respect to the TTC, the 2013 operating budget indicates that revenues from the fare box account for almost 70 percent of total operating revenues. Subsidies from the City are 27 percent, and the remaining revenues come from advertising, property rentals, and other miscellaneous revenues (Toronto Transit Commission 2012b). Capital subsidies are provided by three levels of government: 47 percent from the City, 29 percent from the province, and 24 percent from the federal government in 2010 (Toronto Transit Commission 2012a).

11. Metrolinx merged with GO Transit in 2009.

Table 4.1: Recommendations for Transit Funding in the GTHA – An Overview of Selected Reports

	Metrolinx (2013)	Transit Investment Advisory Panel (2013)	Toronto Region Board of Trade (2013)	City of Toronto (2013)	Kitchen and Lindsey (2013)
Reform transit fares					X
Highway tolls				X	X
High occupancy toll (HOT) road	X		X	X	
Parking levy					X
Business parking levy	X		X	X	X
Paid parking at transit stations	X				
Fuel tax	X	X	X	X	X
Vehicle registration levy				X	X
Sales tax	X	X	X	X	X
Land-value capture	X	X	X		
Increased development charges	X			X	
Corporate income tax		X			
Public-private partnerships			X		
Municipal borrowing		X			
Federal funding	X	X	X	X	

principle that all new revenues would be dedicated to specific outcomes to assure the public that the funds from the revenue tools are not being diverted to other priorities.[12] Another more clearly Wicksellian principle was to promise accountability and transparency through regular reporting to the public on how the funds are being collected, managed, and spent. However, the other two key principles—fairness in the distribution of benefits and costs of the investment strategy across population groups, and equity across the region with respect to the benefits from transportation infrastructure—are both fuzzy and obviously more politically than economically motivated.

Five additional selection criteria were used to narrow down the twenty-five possible "investment tools" initially considered. The first criterion was that revenues would be significant, predictable, and durable. The second criterion was that they would be reasonable in terms of cost and ease of implementation. The third criterion again fits well with the Wicksellian motive—the desirability of price signals to encourage efficient travel choices. The last two criteria—the promotion of economic competitiveness, and fairness and social equality—again tilt more to political than to economic or administrative needs.

In the end, Metrolinx (2013) proposed that the Big Move should be financed by four specific revenue tools:

- By far the most important, a 1 percentage point increase in the provincial Harmonized Sales Tax (HST) to provide an estimated 65 percent of revenues;[13]
- A five cent per litre increase throughout the GTHA, in addition to the existing provincial taxes on gasoline and diesel fuel (15 percent of revenues);
- A special "business parking levy" to be imposed as an addition to the market-value property tax on off-street, non-residential parking spaces (16 percent of revenues);
- The remaining revenues (about 5 percent) to come from updated and amended development charges levied by municipalities in the GTHA.

12. On the other hand, this "principle" might be less positively interpreted as simply an attempt to provide political cover through earmarking for allocating unrelated revenues to transportation expenditures. For a nice distinction between the (appropriate) earmarking of user fees to service-related expenditures and the (inappropriate) political use of earmarking of revenues to expenditures unrelated to revenue sources, see Dafflon and Daguet (2012), as well as Bird and Jun (2007).

13. Somewhat oddly, given the existence already of a provincial tax credit intended to offset, *inter alia*, the effects on lower incomes of the HST, a special mobility tax credit was proposed to reduce the burden on those with lower incomes. Probably the idea was simply to adjust the present credit, although this is not spelled out in the report.

All the proceeds from these sources would flow into a new provincially created GTHA Transportation Trust Fund to be invested and then distributed in accordance with the investment plan (Metrolinx 2013, 42).

The underlying idea of this investment strategy is clearly to try to relate the revenue tools to the benefits of an improved transportation system—"everyone benefits fairly—everyone pays fairly" (ibid., 73). Some elements of this plan fit the Wicksellian approach: earmarked revenues, improved accountability, and some attention to pricing issues (including externalities). However, it is far from clear that those who are supposed to pay for new transportation investments match up all that well with those who are likely to benefit (directly and indirectly) from the improved system. Table 4.2 provides a summary evaluation of the four revenue tools proposed in the investment strategy (as well as several others suggested in the course of the discussion) in terms of who is responsible for levying the tax, who pays, who benefits, and how travel behaviour, urban form, and so on may be affected.[14]

The most important new financial source proposed is the increase in the provincial sales tax (the HST). The justification given for choosing this instrument is simply that residents and businesses throughout the region benefit socially, economically, and environmentally from an effective transportation system and that the tax would be paid by these beneficiaries as well as by non-residents (commuters and visitors) who would also benefit from an improved transportation system. The desire to tax non-residents who use services in the region is specifically given as one reason for preferring the sales tax to increases in the main existing local tax, the property tax.[15] In addition, some benefits might also accrue to neighbouring jurisdictions to the extent that people in the GTHA shop, work, or move their business to avoid the tax.

Curiously, however, there is no mention in the report that the obvious reality that there is no way to implement an increased provincial sales tax only in the GTHA. In all likelihood, the HST would have to be raised in the province as a whole, with the estimated portion collected in the GTHA directed to the new Transportation Trust Fund and the balance perhaps remitted in the form of an enhanced sales tax credit to non-GTHA residents or perhaps channelled to municipalities outside the GTHA as a transfer. Even if some such scheme may conceivably make this

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14. A study commissioned by Metrolinx reviewed twenty-five revenue tools in terms of revenue potential, costs, impact on behaviour and network performance, technical implementation, governance, equity and distributional impacts, and economic efficiency (AECOM 2013). Borrowing and public-private financing are not included in Table 4.2 because neither is strictly a revenue source, since both give rise to liabilities against future revenue streams.

15. Interestingly, the important non-residential property tax in the GTHA's major urban areas (see Bird, Slack, and Tassonyi 2012) is not even mentioned in the report, although it is almost certainly shifted to non-residents to some extent.

Table 4.2.1: Distribution of Costs and Benefits of Alternative Revenue Tools for Public Transit

Revenue Tool	Description	Responsibility for Levying Tax/Charge	Who Pays?	Who Benefits? And Other Impacts
Main Revenue Tools Proposed by Metrolinx				
Sales tax	Piggyback on provincial sales tax	Province would levy and collect tax	Residents, commuters, businesses, visitors	Neighbouring jurisdictions benefit from cross border shopping, work and business location decisions; no impact on travel behaviour
Fuel tax	Piggyback on provincial fuel tax	Municipalities/regions could levy surcharge on provincial tax; province collects tax	Drivers	Neighbouring jurisdictions benefit from cross border fuel purchases; reduction in vehicle use benefits residents (reduced GHG emissions)
Business parking levy	Tax levied on assessed value of non-residential parking spaces	Municipalities collect tax; province sets rate	Businesses and/or drivers depending if parking is free or not; if borne by businesses, could be passed on to consumers	Reduced parking congestion benefits drivers; more space for other uses benefits users of space
Increased development charges	Charge per lot for growth-related costs associated with new development	Municipalities would levy charges	Developers, land owners and/or new homebuyers	Helps meet "smart growth" objectives if based on marginal cost

…continued

Table 4.2.2: Distribution of Costs and Benefits of Alternative Revenue Tools for Public Transit

Revenue Tool	Description	Responsibility for Levying Tax/Charge	Who Pays?	Who Benefits? And Other Impacts
Other Revenue Tools Recommended by Metrolinx				
High Occupancy Toll lanes (HOT)	Vehicles with one person travel in HOT lanes by paying a toll	Metrolinx or Province	Drivers in HOT lanes	Increased speed for drivers in tolled and untolled lanes; increased choice
Paid parking at transit stations	Charge for parking at transit stations	Metrolinx	Transit users who drive	Reduced land dedicated to parking; fewer drivers to transit stations
Land-value capture	Tax that captures incremental increase in land value from transit investment	Metrolinx or municipalities	Developers, land owners and/or residents and businesses	Help achieve "smart growth" objectives through denser developments

…continued

Table 4.2.3: Distribution of Costs and Benefits of Alternative Revenue Tools for Public Transit

Revenue Tool	Description	Responsibility for Levying Tax/Charge	Who Pays?	Who Benefits? And Other Impacts
Additional Revenue Tools Discussed				
Transit fare increase and/or change in structure	Could vary with distance travelled and/or time of day	Municipal transit authorities	Transit users	Varying fare by distance and time of day improve efficiency of system, benefitting users
Highway tolls	Charge for use of highway	Province levies and collects tolls	Drivers on toll roads (indirectly, drivers on untolled roads through increased congestion from diversion)	Reduces vehicle use; benefits residents through lower GHG emissions; benefits drivers through less congestion
Vehicle registration levy	Piggyback on provincial levy per vehicle owned	Municipalities would set rate; province would collect tax	Vehicle owners	Reduces vehicle purchases; benefits residents through lower GHG emissions

…continued

Table 4.2.4: Distribution of Costs and Benefits of Alternative Revenue Tools for Public Transit

Revenue Tool	Description	Responsibility for Levying Tax/Charge	Who Pays?	Who Benefits? And Other Impacts
Street parking levy	Charge based on time parked	Municipalities levy and collect user fee	Drivers	Reduced congestion while drivers look for parking spaces
Corporate income tax	Piggyback onto provincial corporate income tax	Province would levy and collect the tax	Corporations	Neighbouring provinces; no impact on travel behaviour
Increase in property tax	Tax on assessed value of residential and non-residential property	Municipalities would levy and collect the tax	Residential tax on property owners/tenants; business tax on owners, tenants, consumers in taxing jurisdiction and other jurisdictions (tax exporting)	Potential reduction in density of development
Payroll tax	Tax on employees	Province	Employers and employees	No impact on transportation or land use; potential impact on jobs and the economy
Vehicle kilometres travelled (VKT)	Fee system based on vehicle kilometres travelled	Province or Metrolinx	Drivers	Reduces number of trips at peak times; more efficient system for drivers
Federal funding	Federal transfer to province or municipal governments	Federal government would use its tax revenues to pay for regional transit	Taxpayers across Canada	Drivers and transit users in the region; no impact on travel behaviour

proposal administratively feasible, it is far from satisfying any reasonable "user pay" rationale. Its main virtue is apparently political: because the provincial government would be responsible for increasing the sales tax rate, local politicians would be off the hook.

The fuel tax has a similar political rationale—since it is a provincial tax, provincial rather than local politicians would be seen as responsible—but it has a much stronger economic rationale. Increased fuel taxes provide an incentive to drivers to make use of transit and thus potentially reduce congestion and greenhouse gas emissions; in addition, some of the funding would go to improved roads.[16] However, to a limited extent, some drivers may purchase fuel outside of the region.[17]

The last two components of the proposed revenue package, unlike the first two, would be the responsibility of local governments themselves.[18] The rationale for the business parking levy (based on the assessed value for property tax purposes) is that businesses benefit from a better transportation system. Curiously, the proposal seems to assume that businesses will bear the cost of the levy themselves rather than passing it on to drivers (where there is paid parking) or consumers (where parking is free). A business parking levy may result in a reduction in parking spaces and land being put to other, more economically rewarding (and therefore socially valuable) uses.

The last component of the recommended revenue package is an increase in local development charges. Development charges are currently levied throughout the GTHA to pay for the growth-related capital costs associated with new development. However, since municipalities cannot use such charges to provide services that exceed the average standard achieved over the previous ten years and transit expenditures have been very small or non-existent in the areas in which most new (greenfield) developments are built, Metrolinx (2013) proposes a change to the rules to enable municipalities to levy development charges for transit.[19] The rationale for such charges, as with those levied to finance other public works such as streets, sewers, and parks, is that land developers benefit from the increased residential and commercial development opportunities and the higher property

16. Kitchen and Lindsey (2013) review empirical studies on the impact of fuel taxes on driving and conclude that fuel taxes could reduce driving considerably in the GTHA, especially in areas with a good public transit system.

17. Shopping around for cheaper gas is a problem in Vancouver, which imposes a $0.17 per litre charge to fund public transit (ibid.). However, the area of the GTHA is so large and the proposed tax is much smaller than in Vancouver that such cross-border shopping for fuel seems likely to be worthwhile only for large transport vehicles.

18. Although local governments would collect the business parking levy through the property tax, it would likely be the provincial government that sets the tax rate. These details have not yet been sorted out.

19. A 10 percent discount is also applied to the assessed charges for transit.

values resulting from the public investment. Development charges, however, are more likely to be passed on to new homebuyers (or back onto landowners) than to be borne by developers (Slack and Bird 1991). Regardless of their incidence, such charges may provide an incentive for denser developments close to existing services (Slack 2002), although to do so they would have to be levied based on marginal costs rather than the average cost basis currently used in most areas.

Transportation provides a classic example of a local service in which the benefits spill over municipal boundaries. So, who benefits and who pays across the region? Metrolinx (2013, 75) estimates that the City of Toronto (the core city of the region) would contribute 41 percent of the overall revenue generated by the investment tools and receive 42 percent of the funds (excluding development charges), and the suburban municipalities would contribute 59 percent of the overall revenues and receive 58 percent of the project funds (also excluding development charges).[20] As Metrolinx sees it, its revenue plan thus satisfies the initially stated goal of achieving at least rough "equity" across the GTHA as a whole.

Although the initial Metrolinx report attempted to provide a package that would not only generate sufficient revenue to fund the planned investment but also be politically acceptable and even (to a small extent) provide incentives to more rational and sustainable transportation and development, it failed in doing so. The report's failure to square the circle of revenue, politics, and sensible economics is not surprising since almost no one anywhere has managed to do so. However, it is particularly glaring from the perspective of this paper because instead of narrowing the gap between the three circles of the Wicksellian Connection—those who decide, those who benefit, and those who pay—it would actually make the connection weaker by pushing most of the cost up to the provincial level and hence even further away from influencing the decisions of municipal politicians and officials, private developers, and businesses and households that have led to the problems the Big Move is supposed to resolve.

Subsequent Debate

After the release of the Investment Strategy by Metrolinx, recommendations were made by other bodies: the provincially-appointed Transit Investment Strategy Advisory Panel, the Toronto Region Board of Trade, and the City of Toronto. The Residential and Civil Construction Alliance of Ontario (RCCAO) also commissioned a report on financing roads and public transit in the GTHA (Kitchen and Lindsey 2013). How well did the subsequent reports do on implementing the Wicksellian Connection? Their main recommendations on financing, as well as the

20. The basis for these estimates is not entirely clear.

original Metrolinx proposals discussed above, are summarized in Table 4.1 and briefly evaluated in Table 4.2.[21]

In addition to the direct and indirect benefits of an improved transportation system, some of these tools are likely to have a positive impact on reducing automobile use (vehicle registration levy, highway tolls and high-occupancy toll (HOT) lanes, and paid parking at transit stations), reducing congestion (highway tolls and HOT lanes), and lowering GHG emissions (highway tolls and HOT lanes, and vehicle registration levy).[22]

The Transit Investment Strategy Advisory Panel (2013), which was appointed to review the Metrolinx Investment Strategy, applied six principles to the evaluation of funding tools: sufficient and sustainable revenue; fairness across regions and among income groups and sectors; ease of implementation; provision of choice and encouragement of less reliance on the automobile; minimization of economic impacts and distortions; and accountability and transparency. The link between expenditures and revenues appears to be under the fairness criterion, which states that funding options should strike a fair balance in which all sectors that benefit from transit contribute. Sectors are defined to include individuals (transit users) as well as drivers and businesses.

Although the panel's recommendations for a fuel tax and a sales tax (as well as increased federal funding) were similar to those of Metrolinx, it diverged from the latter on parking levies, arguing instead in favour of a corporate income tax. The panel recommended two packages of options. The first option included a phased and capped increase to the gasoline and fuel taxes; a modest increase to

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21. Most the items listed in Table 4.2 were included in the "short list" of possible revenue sources considered in Metrolinx (2013) with the curious exception of vehicle registration levies, which were presumably excluded because the City of Toronto, the only municipality in Ontario entitled to impose such a fee, had recently decided to discontinue the tax. The stated rationale for excluding such levies as well as other vehicle-related fees such as taxes on auto insurance, drivers' licences, new vehicle purchases, and parking was that such charges would provide little revenue and were not directly related to vehicle usage and thus provided no useful incentives. Additional corporate income taxes were rejected as impossible and undesirable at the regional level. The possibility of a personal income tax surcharge (which would be both technically possible and economically sensible) has apparently never been mentioned by anyone during the long discussion of regional transit financing—an interesting commentary on the current low esteem of this once dominant tax in North America. Even more interesting, no one suggested even a modest increase in property taxes as a possible revenue source.

22. Who would end up bearing the additional fiscal burden is not always clear. The incidence of the property tax, for example, is usually assumed to be on property owners in the taxing jurisdiction but it may also be borne by others, for example, to the extent that business property taxes are exported to other jurisdictions.

the general corporate income tax rate; and the earmarking ("redeployment") of a small portion of HST revenue charged on gasoline and fuel taxes. Under the second option, there would be a phased increase to the gasoline and fuel taxes capped at a lower rate than under the first option, with the foregone revenue made up from an increase in the HST. The second option also included a corporate income tax increase and redeployment of the HST on gas and fuel. The panel's recommendation on land-value capture was that Metrolinx work with municipalities and the land development industry to develop a strategy for the next wave of transit projects. It also recommended greater use of borrowing at the municipal level to finance local transit improvements.[23]

Although most of these recommendations are not new or surprising, the panel was the only one to recommend an increase in the corporate income tax. This recommendation is curious given that corporate income taxes have fallen in major trading countries and there does not appear to be any justification for making it more costly for Ontario corporations to compete. Taxing mobile corporate capital and corporate profits encourages firms to shift their investments and profits to lower-taxed jurisdictions. The revenue potential of corporate income taxes is also variable. Taxes based on a mobile tax base are not good candidates for local taxation (Kitchen and Slack 2013).

The Toronto Region Board of Trade highlighted the need for "a mature and informed conversation with the public about the importance of transportation investments and the need for new and dedicated revenue sources to pay for them" (Toronto Region Board of Trade 2013, 6). The board set out eight evaluation criteria: revenue generation (i.e., it needs to be substantial); equity and fairness (in terms of how it affects different segments of the community including commuters and non-commuters); public acceptance; economic effects (how it affects the regional economy); revenue sustainability and variability; impact on travel behaviour; cost of implementation and operation; and successful track record elsewhere. In addition to calling for federal contributions, land-value capture, and public-private partnerships, the board recommended four dedicated revenue tools to pay for transit infrastructure: a parking-space levy, regional sales tax, regional fuel tax, and high occupancy vehicle (HOV) lanes. It rejected four tools that were part of an earlier board list: increased income tax, higher property taxes, road tolls, and employer payroll taxes.

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23. Although borrowing is not further discussed here, as Dahlby and Smart (2015) have noted, the strongest case for financing local capital outlays through borrowing is when user fees (or equivalent benefit-related levies) are expected to be sufficient to finance the loan. Interestingly, a recent US study found that localities where local politics are more competitive are more likely to make use of such "revenue bonds" to demonstrate their political commitment to linking expenditures and revenues (Aneja, Moszoro, and Spiller 2015).

Greater Toronto CivicAction held a forum in April 2013 with civic leaders from across the GTHA. In a report summarizing the feedback, it suggested that any new revenue tools be earmarked for transportation and that a "basket of sources," including some tools that change behaviour, was needed. Noting that everyone benefits from a better transportation system (drivers, cyclists, pedestrians, and transit users throughout the region), the report recommended that everyone should be part of the solution—perhaps a nod to Wicksell? The authors also recommended transparency and accountability (Greater Toronto CivicAction Alliance 2013). Delegates to the forum reviewed the Metrolinx proposals and supported high occupancy tolls in the short run, followed by highway tolls in the long run and a dedicated fuel tax. At the same time, delegates opposed significant transit fare increases and property taxes and expressed concern about a parking space levy. There was no consensus on the other tools proposed by Metrolinx, but they did feel that land-value capture and vehicle kilometres travelled (VKT) fees be considered for further study.[24]

The City of Toronto staff report on transportation funding noted the widespread benefits of transportation investments including employment opportunities, improved transit accessibility and convenience, reduced travel times, more efficient goods movement, and increased property values (City of Toronto 2013). Unusually, the city report also linked the beneficiaries to potential taxes and fees to pay for them. The criteria for selecting appropriate revenue options included policy fit, with the best taxing options resulting in reduced congestion or increased intensification or transit use, and minimal disincentives to business; revenue quality (sufficiency, stability, future expectations of growth); fairness in the sense that the incidence of the tax should be linked to the benefit from the expenditures geographically and across various segments of the economy (the tax must be enforceable); and finally, efficiency—although only in the very limited sense that the administrative costs are reasonable.

Based on these criteria, city staff recommended four tools: fuel taxes, sales taxes, increased development charges, and a commercial parking levy. City staff also indicated that council should support the use of the following revenues upon substantial completion of the Metrolinx first wave of projects: high-occupancy-vehicle lanes, tolls or other road pricing, and a vehicle registration tax (City of Toronto 2013). The city report also made clear which revenue tools it opposed: a congestion levy, employer payroll tax, land transfer tax, land-value capture, personal income tax, property tax, transit fare increase, and a utility bill levy. And, of course, as did the other reports, the city report called for increased federal funding.[25]

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24. Tables 4.1 and 4.2 do not specifically cite this source because the points mentioned here came up in a session held at the forum and are not based on any specific study of revenue tools.

25. On federal funding for infrastructure, Boadway and Kitchen (this volume) make a strong case that it makes little sense for municipalities to receive grants from the federal

While these various provincial and local reports were making recommendations on how to fund the Metrolinx Big Move, a report by Kitchen and Lindsey (2013) made recommendations for road and transit funding in the GTHA. The seven principles guiding their results are: economic efficiency (charging marginal cost); accountability (linking the use of a service with the price charged); transparency; consistent, sustainable revenue yields; ease of implementation; ease of administration; and fairness or equity. Their recommendations called for better pricing of transit to reflect distance travelled and time of use as well as fare integration throughout the region; parking levies (restructured on-street and off-street parking fees plus commercial parking sales taxes or parking levies); and road pricing (e.g., tolls). The authors argued that these revenue sources would not only bring in revenues to pay for transit, but would also alter the behaviour of transit and road users. Kitchen and Lindsey know that these sources will not bring in sufficient revenues to pay for transit, so they also recommended a sales tax, a vehicle registration tax, and a fuel tax.[26] Of all reports reviewed, that of Kitchen and Lindsey (2013) provide the best example of applying the Wicksellian Connection to transit and road finance in the GTHA. It is the only report that places improved transit fares and highway tolls as the cornerstone of their recommendations.

Land-value capture is mentioned (though not necessarily recommended) as an option in the Metrolinx Investment Strategy, but mostly in an offhand way. Other reports recommended considering land-value capture in the future after more study. Land-value capture was not seriously considered until John Tory, then the-soon-to-be mayor of Toronto, made it a central plank of his election campaign as the major way to pay for his transit vision, known as SmartTrack (Gee 2014). Under land-value capture, the increase in property values generated by the transportation investment is used to help pay for the capital costs. Land-value capture can take many forms, such as tax increment financing (TIF), special assessment districts, and betterment levies.[27] Land-value-capture taxes provide a link between the benefits of the transportation investment for property owners and the cost of the infrastructure. But this approach neither charges the direct users of the transit system nor captures the benefits to drivers or other indirect benefits to the community except those accruing to nearby property owners in terms of increased property values.

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government. Bazel and Mintz (2014) also argue that federal transfers paid directly to municipalities undermine political accountability. Both papers, however, agree that it makes sense for the federal government to work with provinces.

26. A subsequent study by Kitchen (2014), however, suggests that a range of factors is likely to lead to declining fuel taxes in the future: the push for more energy-efficient vehicles; increased reliance on electric and hybrid vehicles; the trend for younger adults living in highly urbanized areas to drive less; and retiring Baby Boomers who will be driving less.

27. For a more detailed discussion of land value capture, see Smolka (2013) and Ingram and Hong (2012).

To be successful, land values must increase sufficiently to generate the predicted tax revenues needed for the investment.[28] If the increase in land values is not sufficient to generate the needed revenues, the resulting lack of funds would have to be made up from higher property taxes—always unpopular politically—or from increased borrowing. Moreover, since land use and transportation planning are not coordinated together on a regional basis in the GTHA, there is no guarantee that the density needed to increase property values sufficiently along transit lines will actually occur.

SUMMING UP

The basic problem in financing public transit is that it is impossible to pay for the needed infrastructure on a full cost recovery basis because the system is in competition with the generally underpriced road system. To compound the problem, the road system is itself the critical substantial "feeder" to the transit system for most people in the region. If one does not tackle road pricing properly, it is simply not possible to develop a sustainable public transit system without continuing, and significant, subsidization from general funds. The dependence of the Metrolinx plan on the probably technically infeasible HST supplementary charge might perhaps be an implicit admission of this fact.[29] The other three components of the Metrolinx revenue plan, as discussed above, are more promising from all perspectives—economic, political, and administrative—but they cannot generate the needed funds.

Metrolinx (2013), which argues that transit users should only cover operating costs and cannot be expected to cover capital costs to any significant degree, discusses the possibility and desirability of relying more heavily on charging road users more accurately for the costs to which they give rise. However, Metrolinx seems to think, probably realistically in political terms, that generating substantial funds from this source to pay for public transit facilities is not something that is going to happen soon, or easily. Kitchen and Lindsey (2013) are more optimistic, recommending a package of road tolls, more efficient parking-fee structures, and other road-user charges, plus transit fares based on distance travelled and time of

28. Although there are some examples of the successful use of land-value capture to pay for transit (e.g., Crossrail in London), there are other examples where predicted revenues did not materialize (e.g., the extension of the Subway Line 7 to serve the new development in Hudson Yards in New York City). For some examples of the successful use of land-value capture for urban public transport finance, see Regional Plan Association (2014). For the Hudson Yards example, see New York City Independent Budget Office (2013).

29. The fact that this recommendation has already been declared to be completely unacceptable by the federal government, which administers the HST, means that nothing is yet actually settled about Metrolinx financing (Benzie and Kalinowski 2013).

day. This approach, together with a program of borrowing for transit with such a package of user-related charges generating the funds needed to repay the loans, would obviously be much more sensible. However, even Kitchen and Lindsey (ibid.) fail to discuss just how these financing decisions should be made and who should make them—the most critical issues, from the Wicksellian perspective.

Although the focus of this paper is on finance and not governance, the lack of an accountable and effective regional governance structure hampers the implementation of new financial tools (Kitchen and Lindsey 2013).[30] Some tools, such as a parking levy or vehicle registration tax, could be levied at the local level if the provincial government granted to other municipalities increased taxing powers, like those that Toronto has under the City of Toronto Act. Area-wide taxes or charges to pay for inter-regional transportation cannot be easily implemented, however, because there is no adequate regional jurisdiction to levy them. Metrolinx comes closest to being a regional structure for transportation, but it has few powers and no ability to raise revenues or to borrow. Reliance on voluntary inter-municipal cooperation and inter-local agreements only works under certain circumstances (Spicer 2015). In particular, municipalities need to be willing to cooperate and capable of doing so. In the case of transit in the GTHA, the wrangling over something as relatively simple as the implementation of the Presto card throughout the region suggests that cooperation is likely to fall well short of this high standard—unless perhaps the strong hand of the province compels all to cooperate.

In reality, when inter-local agreements do not work, the province inevitably becomes the "regional" government, making regional transportation decisions and taking responsibility for levying region-wide taxes and charges. However, the province, representing as it does both interests within the region and those located elsewhere, seems clearly unlikely to reflect local interests very accurately—though it could certainly play an important role in setting out an agreed set of facts on which better local decisions might, one may hope, be made. On the other hand, if some of the financing proposals discussed above were to go ahead, the province might indeed play a critical role in providing more adequate representation of the interests of the many non-users who may end up paying for the infrastructure. In any case, as usual with metropolitan finance issues, the governance issue needs to be much more clearly resolved than at present if new revenue sources are to be found to pay for transportation infrastructure in the region.[31]

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30. Alternative governance options considered by Kitchen and Lindsey (2013) include provincial responsibility for transportation, a special-purpose body such as Metrolinx but with an elected board of directors and taxing and spending powers, and restructured municipal governance for the GTHA that includes all municipal functions. Although they prefer the last of these, they appreciate that it is unlikely to be acceptable in the current political environment.

31. Ontario and the GTHA hardly stand alone in this respect, of course. As Bird and

POLITICS MAY RULE: BUT MUST THE RESULTS ALWAYS BE INEFFICIENT?

Section 1 of this paper emphasizes the importance of the Wicksellian Connection—the tightness of the connection between decisions on public spending and on its financing—in determining whether local public-policy decisions are right in the sense of matching what people want with what they are willing to pay for. The more closely spending and taxing decisions are linked by being made by the same body at the same time, the better government will function in its economic manifestation as a provider of services. As the recent Ontario discussion of how to finance rapid transit in the Toronto metropolitan regions shows, however, Canada—like most countries—has done little to establish a strong Wicksellian Connection with respect to the local governments that most directly provide public services to citizens.

The question is important. The local level is where public-sector efficiency is most directly relevant to daily life. If local governments are to make efficient decisions about public infrastructure investments, they need to be not only controlled by those they serve but also self-financed at the margin rather than dependent on the largesse of others.[32] Unless the essential information on who pays what for what, and why, is transparent, easily accessible, and adequately understood—and accepted—by those affected by spending decisions, even the best-run and best-governed locality is unlikely to make fiscal decisions in a socially efficient way. The political advantages of providing services with "other people's money" are so great and the technical difficulties of evaluating and properly pricing many public services so considerable that even exceptionally strong intergovernmental reporting and accountability structures are unlikely to lead to the achievement of anything close to public sector efficiency in complex metropolitan regions like the GTHA. And this whether or not there is an adequate overarching metropolitan governance structure.

Ideals are seldom easily attainable. But it is not hard in principle to move towards establishing a stronger Wicksellian Connection between taxes and expenditures at the local level. One might, for example, begin by establishing the foundations: an improved information base available to local officials and citizens; better technical support (e.g., in establishing good pricing systems); and an appropriate local equalization transfer system to induce localities to focus more on efficient provision

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Slack (2013) emphasize, the lack of adequate metropolitan regional governing structures creates serious constraints in most countries when it comes to providing local services efficiently in metropolitan areas.

32. Note that this does not mean that all local infrastructure must be financed entirely from local revenues. However, if infrastructure investments are to reflect local preferences, then local beneficiaries should be responsible for financing a share of the cost equal to the benefits they expect to receive from the investment in question.

of services at least cost. Advances in technology have made it much easier for cities to impose such user fees as road tolls, transit fares, and parking charges. In Singapore, for example, in-vehicle units affixed to car windshields allow drivers on toll roads to be charged according to location and time of day. In San Francisco, new technology permits the use of marginal-cost pricing for parking: the city uses smart meters that allow it to charge variable rates, record parking use and duration through sensors, and transmit the data to a central collection system.

Although many citizens, in Canada, as elsewhere, appear to be not all that happy with what governments do, most seem to attribute bad outcomes mainly to the unfit crowd in charge rather than to flaws in the design of the ship of state. People may care only about results and not processes, but outcomes depend as much or more on the way in which policies are decided as on the policies themselves, regardless of which set of politicians and officials came up with them. The way countries "do" politics—like the way they "do" local finance (Bird 2011)—has largely been inherited from the past and shaped in part by what was then technologically feasible. Now, however, it is technologically feasible for everyone to be able to vote on anything at any time—if we want to follow this path. There may be good reasons why we should not do so and should instead stick with the tried and true systems we have. But there are also bad reasons for doing so, including what seems to be the deep distrust of many in the elite with respect to the ability of ordinary people to decide what is best for themselves.

Some seem to think that if people are allowed to decide important things—like public policies—they will usually act emotionally, irrationally, and against their own long-term interests. It may well be true that people are and will remain rationally ignorant of most public policy issues. It may also be true that few are willing to put in the hard work needed to make real power-sharing worthwhile and that the process might—despite technological advances that allow us both to generate the needed information and to make it easily available to all relatively cheaply—turn out to be slow and inefficient or seized and controlled by a self-selected few. Certainly, more widespread and direct political participation, like more transparency in government in general, would make the life of governments more difficult and may perhaps bring to the surface fundamental disagreements on norms, thus perhaps increasing rather than reducing conflict. The result might be less growth and more redistribution—or the opposite. There are, as there have always been, many reasons for being cautious about increasing local democracy.

Winston Churchill once said that democracy may be the worst of all governments except for all the rest. Much the same may perhaps be said of more participatory democracy, especially at the local level where introducing much stronger market elements than are now present in most countries is now technologically feasible as well as economically desirable. Sharing power is always a scary exercise—especially for those who now have the power—but perhaps the time has come to see which nineteenth-century sage was right: Was it the one who said there is a fool born every minute, implying that people are best seen as suckers to be fooled

or sheep to be fleeced, or at least led? Or the one who said you can fool all of the people some of the time and some of the people all of the time, but you cannot fool all of the people all of the time?[33] No one has the answer to such questions, but thinking about restructuring local government finance tests the degree and danger of local foolishness in ways that—provided the Wicksellian Connection is firmly in place—will not cause undue harm to innocent bystanders.

The basic problem with adopting a more Wicksellian approach to financing transit or anything else is that almost no one wants to hear such unpleasant truths as that users should pay or that redistribution through mispricing local public services is almost always a bad idea.[34] It is not easy to think of how to sweeten such bad news sufficiently to make it politically palatable. Nonetheless, if local government finances are ever to move in this direction, someone must be willing and able not only to deliver the bad news but to persuade people that the message is real and needs to be dealt with. Perhaps the only way to do so may be to begin at the beginning, by explaining clearly to people what the costs and benefits of different courses of action are with respect to problems such as financing regional transit systems, and then, over time, not only convincing enough of them that what you say is true but also bundling such policies with whatever sweeteners may be possible. Economics, like medicine, cannot be done in the laboratory alone: it requires close and often complicated engagement with patients and their families (policy-makers and their constituents).

Policy economists could perhaps learn some useful lessons from such protocols as the medical profession's ABCDE approach about how to tell bad news to patients: Advance preparation; Build good relationships; Communicate well; Deal empathetically with reactions; Encourage and validate emotions while correcting distortions.[35] Still, it seems unlikely that many politicians will be willing to risk their futures by being messengers who deliver to the public what most people will see as the bad news that not only do they have to pay for what they get but also, to add insult to injury, that it will in the end be good for them to do so.

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33. The "sage" to whom the first saying is attributed is usually said to be P. T. Barnum, a famed American showman, while the second is usually attributed to Abraham Lincoln, although in fact neither saying can be accurately attributed—unlike the remark by Churchill we cited earlier, which is discussed in depth by Lindert (2003).

34. The redistribution that results from lower transit fares for seniors, for example, provides an implicit subsidy for wealthier seniors (Kitchen 2015). Unfortunately, as is always the case, once governments establish an inefficient pricing structure (for any reason) it is invariably exceedingly difficult to change because the losers will protest and the winners—society at large—is unlikely to notice any gains.

35. This is a slight modification of a protocol suggested by Rabow and McPhee (1999).

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5

A FISCAL FEDERALISM FRAMEWORK FOR FINANCING INFRASTRUCTURE

Robin Boadway and Harry Kitchen

Canada is alleged to have a serious infrastructure deficit. The precise meaning of this contention is not easy to specify, but conceptually it suggests that the existing level of infrastructure falls short of some benchmark optimum.[1] This deficit has two dimensions: quality and quantity. The existing stock of infrastructure may be of low *quality* because it has been allowed to deteriorate and needs to be replaced or upgraded. The *quantity* of infrastructure may be deficient to the extent that it has not kept pace with the growth of population and of the economy, and with the shift in population from rural to urban areas and among regions. Both dimensions of infrastructure deficit are likely to be true to some extent, but we are not certain, because there are no recent and reliable data on capital spending by level of government in Canada and how it has changed over the past few years.[2] Given this lack of information, it is an open question as to how serious the infrastructure deficit actually is.

The notion of an ideal amount of infrastructure is necessarily vague, and relying on estimates compiled by stakeholders like the Federation of Canadian Municipalities (FCM), provincial associations of municipalities, municipal administrators, or provincial premiers can be problematic, given that their purpose

1. A prior question is: what do we mean by infrastructure? We take here an expansive view to include virtually all forms of public capital, including capital used to provide public services like hospitals, schools, post-secondary institutions, libraries, sidewalks, water purification, and sewage disposal facilities; capital provided by the public sector for the use of the private sector, like transportation and communications facilities; and capital used to provide public goods, like environmental control investments, defence equipment, courts, and prisons.

2. Statistics Canada is expected to release data in November 2015 on capital spending by level of government for the period 2008–12.

is partly to elicit financial support from higher levels of government.[3] There are some objective indicators of shortfalls, such as rates of congestion on the roads (Dachis 2013), disruptions on the railways, overcrowded classrooms and hospitals, contaminated drinking water, and inadequate flood protection. As well, there is some evidence suggesting significant economic benefits from infrastructure spending. For example, a recent Conference Board of Canada report (2013) undertook a detailed examination of the impact of infrastructure spending on job creation and found that for every $1.0 billion in infrastructure spending, 16,700 jobs were supported for one year. These jobs were not only in construction but spilled over into manufacturing, business services, transportation and financial-sector employment. The same report estimated that for every $1.0 billion in spending, GDP would be boosted by $1.14 billion, resulting in a multiplier effect of 1.14. Other studies have shown similar effects, with estimated multipliers ranging from 1.14 to a high of 1.78; Finance Canada's "Seventh Report to Canadians," for example, estimated a multiplier of 1.6 (Finance Canada 2009, 2011). These studies suggest that investing in more infrastructure would be socially and economically profitable. However, going from such evidence to precise estimates of the infrastructure deficit is not possible.

For the purpose of this paper, knowing the precise size of the infrastructure deficit is not necessary. The focus here is instead on why an infrastructure deficit exists. Why do governments not make sufficient infrastructure spending if it is so beneficial? Given the decentralized nature of infrastructure investment, is there something in the system of intergovernmental fiscal arrangements that leads to underspending on infrastructure? More generally, what would the architecture of federal fiscal arrangements look like if one wanted to ensure adequate infrastructure investment, both new and replacement? Identifying this is a formidable challenge, but one that requires consideration.

BRIEF OUTLINE OF CURRENT ARRANGEMENTS

We begin by outlining the key features of the federal fiscal arrangements as they affect infrastructure. By this we mean not only the assignment of responsibilities, but also the division of tax room and the structure of grants. The context is informed by the basic principles of fiscal federalism, and all three main levels of government are included. We include issues of deficit financing to the extent that they are relevant for financing infrastructure.

Ultimately the assignment of responsibility for infrastructure relies on the Constitution, or at least must conform to it. The Canadian Constitution makes no direct reference to infrastructure, but infrastructure spending obviously must be consistent with the functional responsibilities that are set out in sections 91–95.

3. A recent request/demand appeared in late March 2015. See Curry (2015a).

The federal government has legislative responsibility for the postal service, shipping and navigation, ferries, the sea coast and inland fisheries, and public debt and property. Provinces and municipalities within their boundaries are responsible for hospitals, schools, prisons, matters of a local or private nature in the province, and local works other than (a) those that connect with works in another province or extending beyond a province, (b) shipping with foreign countries, and (c) works within a province that are declared by the Parliament of Canada to be of general advantage to Canada or for the advantage of two or more provinces. In practice, municipalities are generally responsible for local infrastructure, like roads, buses, garbage and sewage, water, libraries, and recreation facilities. The provinces are responsible for provincial roads, intercity transit, schools, and hospitals, and they exercise close oversight over municipal infrastructure spending. The federal government is responsible for interprovincial transport, defence establishments, First Nations' infrastructure, pipelines and telecommunications. All levels of government have their own procurement policies, although provinces are nominally, but ineffectively, constrained by the Agreement on Internal Trade.

An important addition to the Constitution in 1982 was the statement of principles set out in Section 36. Section 36(1) commits the federal government and the provinces jointly to promoting equal opportunities, furthering economic development to reduce disparity in opportunities, and providing essential public services of reasonable quality to all Canadians. Section 36(2) commits the federal government to the principle of making equalization payments to ensure that provincial governments have sufficient revenues to provide reasonably comparable levels of public services at reasonably comparable levels of taxation. The relevance of these commitments for infrastructure is discussed further below.

As should be apparent, the Constitution leaves considerable discretion in infrastructure spending by the various levels of government. In practice, infrastructure spending is highly decentralized relative to program expenditures more generally. The most comprehensive and recent study on the stock of physical infrastructure (Roy 2008) indicated that most it is at the local level.[4] In particular, by 2005, over 58 percent of all capital stock in Canada was local, almost 30 percent provincial, and a bit more than 12 percent federal. From 1961 to 2005, the relative importance of local infrastructure increased dramatically in every region, while the federal importance declined everywhere, and the provincial share fell everywhere other than Atlantic Canada.

Provincial and federal infrastructure spending is mainly financed from general revenues and borrowing. Municipal infrastructure spending is financed by current

4. Infrastructure capital in Roy's study is defined as all assets embodied in structures and engineering works. Such capital complements the other factors of production, is long lived, and cannot be easily replaced. Infrastructure does not account for all government capital, which also includes machinery and equipment (such as vehicles and computers).

revenues, reserves (accumulated from development charges, capital cost charges, and so on, and a fraction of annual property taxes that are often collected and deposited in capital accounts), grants, and borrowing. The only long-term borrowing that municipalities are permitted to undertake is for infrastructure or capital projects, and this borrowing is tightly controlled by provincial legislation. This legislation, with some variation across the country, generally includes one or more of the following: permitting borrowing for provincially approved capital projects; requiring prior approval by provincial authorities; restricting annual debt servicing costs to an upper limit percentage of municipal own-source revenues; restricting the amount of debt to an upper-limit percentage of assessed property values; and permitting (or requiring) borrowing from a provincially controlled "municipal fund." In essence, municipalities have little room to manoeuvre when it comes to financing infrastructure (Amborski 2013).

The decentralized structure of infrastructure spending is in the context of a system of federal fiscal arrangements in which vertical fiscal gaps exist, although they are relatively modest by international standards. The federal government collects more general revenues than it needs for its program spending and transfers the excess to the provinces. About 26 percent of federal program spending consists of transfers to the provinces (and territories). The provinces in turn obtain, on average, about 24 percent of their revenues from federal transfers, and about 16 percent of their program spending consists of transfers to municipalities. Total transfers from provinces to municipalities are about 80 percent of transfers that provinces receive from the federal government (Canadian Tax Foundation, 2013, Table A2). Although there is considerable variation across the country, a relatively small percentage of municipal budgets is financed by provincial transfers, and most of this is in the form of conditional grants. Behind these averages, however, there is considerable heterogeneity across provinces: some rely more heavily on federal transfers than others.

Despite the significance of intergovernmental transfers, own-source revenues are very important for provincial and municipal governments. In principle, the federal government and the provinces have unrestricted taxing and borrowing powers. In practice, the extent of decentralization of (non-resource) taxing power to the provinces is constrained by several considerations. The level of reliance of the provinces on own-source revenues depends on the division of tax room of major tax bases between the federal and provincial governments. This division, in turn, is the outcome of ongoing decisions about tax rates by both levels of government and transfers from the federal government. The evolution of program-spending requirements at the federal and provincial levels is also important, particularly the tendency for provincial-spending increases to outpace those at the federal level. Although federal and provincial fiscal decisions are interdependent, it is reasonable to view the federal government as taking a leadership role in determining the extent to which provinces must rely on own-source revenues.

In evaluating the exercise of this leadership role, some important considerations apply. Further decentralization of revenue-raising could jeopardize the harmonization of the tax system, which has been a significant accomplishment of Canadian fiscal arrangements, and has relied in the past on federal dominance in income and value-added tax systems. More decentralization also leads to more horizontal imbalance, which strains the equalization system, especially given the imbalance in resource revenues. It also reduces the ability of the fiscal system to provide long-term insurance against regional shocks, which arguably is a main long-run role of equalizing federal transfers of all types. Federal-provincial transfers play a role in their own right apart from equalization, including the use of the spending power or more subtle federal influence to encourage the provinces to design their programs in ways that further the economic and social union.

Municipal tax powers are much more restricted and depend on provincial decisions. In practice, Canadian municipalities—much more so than almost all other OECD countries (see Supplement A)—rely heavily on property taxes. In Canada, municipalities set the general property tax rate,[5] but they are often restricted as to what they can do when it comes to levying differential taxes on different property types. For example, municipalities in Newfoundland and Labrador, except for St. John's, are required to levy a uniform tax rate on all properties. The same is true for Manitoba, except for Winnipeg. Other provinces (Prince Edward Island and New Brunswick, for example), are required to levy differential tax rates on residential and non-residential (commercial/industrial) properties with the differential rate fixed by legislation. For other differential rates, there are often provincial restrictions on the amount by which the commercial/industrial rate may exceed the residential rate. As well, the number of differential rates that are permitted range from a low of two in some provinces—one for residential properties and a second for commercial/industrial properties—to a high of thirty-six in Ontario,[6] where variable rates may be applied to subcategories of commercial and industrial properties, vacant land, parking lots, and so on (Kitchen and Tassonyi 2012). In addition, there are property tax relief schemes available for seniors, based on age (Kitchen 2015a), and low-income residents, based on income (Kitchen and Tassonyi 2012, 12).

While municipalities set their general property tax rate, they are further constrained by the need to run a balanced operating budget and by the lack of other major own-source revenues. Local tax revenue is supplemented by user fees, licences, permits, and other property charges, including special assessments, and in some cities, development charges, value-capture levies, and tax incremental financing. Arguably the potential for some of these instruments to finance infrastructure has not been fully exploited.

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5. Municipalities have no control over assessment (tax base). This is a provincial responsibility.

6. Ontario Regulation 282/98 under the Assessment Act.

Federal transfers to the provinces take four main forms. First, under the equalization program, provinces with below-average revenue-raising capacity receive unconditional equalization transfers to bring them close to the average. Revenue capacity is measured using the representative-tax-system (RTS) method for personal income taxes (PIT), corporate income taxes (CIT), general sales taxes (HST, PST), and property taxes. As well, one-half of aggregated natural resource revenues are equalized up to the national average.

Several properties of equalization should be noted. Significant horizontal imbalances in revenue-raising capacity remain, despite equalization, because the provinces with above-average revenue capacity (the "have" provinces) are not equalized down. At this time, these are the resource-rich provinces: Alberta, British Columbia, Newfoundland and Labrador, and Saskatchewan. Both provincial and municipal property taxes are included in equalization, which means that national-average revenue capacity includes the main source of municipal own-source revenues. Neither needs nor costs of providing public services are equalized, unlike in Australia where both are, although needs for infrastructure are not explicitly included. Some commentators have argued that either needs or costs or both should be equalized.[7] This argument was rejected by the Expert Panel on Equalization on the grounds that equalizing expenditure needs would be complicated, given that public services can differ widely in quality, causing comparable levels to be difficult to measure (Expert Panel on Equalization and Territorial Formula Financing 2006). For our purpose, needs for infrastructure are not equalized, although revenues used to finance infrastructure are, and provincial population is a determinant of entitlement.[8] Equalization of revenue capacity to the national average is constrained by the gross domestic product (GDP) cap, which limits the growth in total equalization transfers to the rate of growth in GDP. This cap has been binding in recent years, and entails that actual equalization transfers are below those required to raise the have-not provinces to the national average revenue capacity. Data obtained from Finance Canada data show that have-not provinces are equalized up to 95 percent of the national average. Finally, equalization is largely formula driven, so both its absolute size and allocation are determined by the RTS calculations, although this is violated from time to time by federal discretion (e.g., the GDP cap, and the Offshore Accords for Newfoundland and Labrador and Nova Scotia).

The second main form of transfers consists of "social transfers": the Canadian Health Transfer (CHT) and the Canada Social Transfer (CST). These are the

7. See for example, Courchene (2013) and Gusen (2012).

8. Equalization for needs and/or costs would not necessarily affect the total equalization amount significantly. Instead, it would change the way in which the funds are allocated among provinces. To put it differently, the current system of revenue equalization implicitly treats a dollar worth of spending as yielding a dollar worth of public services. If needs/costs were equalized, that would adjust the revenue equalization allocations to reflect differences in the relative costs of providing given public services.

remnants of the shared-cost programs for medicare, hospitals, and social welfare of the 1960s that were instrumental in establishing provincial programs in these areas, and that became Established Program Financing (EPF) transfers once it was deemed that they no longer needed to be shared-cost and conditional. The CHT and CST are equal per capita transfers that have very general conditions attached. Although nominally allocated to health, social welfare and post-secondary education, in practice they are fungible. It is important to note that, since they provide equal per capita transfers funded from federal general revenues, these social transfers are, implicitly at least, partially revenue-equalizing for both have and have-not provinces. (Since natural resource revenues are not collected federally, that aspect is missing from CHT/CST equalization.) The social grants can be seen largely as transfers that serve to fill the vertical fiscal gap. They ensure that the federal government maintains a minimal share of tax room, and also allow the government to exercise its spending power, as well as its moral suasion, to further national objectives.

Third, and of much less importance financially, there are specific-purpose transfers. These include transfers for projects of joint national-provincial interest, such as national highways, training programs, and so on. Some of these are shared-cost programs to recognize that joint interest. Like equalization and social transfers, these can be for infrastructure spending, as is obviously the case for the Trans-Canada Highway.

Finally, there are infrastructure transfers that are more recent. In 2014, the federal government put in place the New Build Canada Fund (NBCF) to replace a similar Build Canada Fund that ran from 2007 to 2014. The NBCF runs for ten years and consists of two components: a $10 billion Provincial-Territorial Infrastructure Component (PTIC), of which $358 million is for program administration, and a $4 billion National Infrastructure Component (NIC), for projects of "national significance." As well, a $10 billion Gas Tax Fund (GTF) is allocated among provinces based on population and intended for municipal infrastructure. The 2015 Federal Budget announced that a new infrastructure fund would start in 2017–18 if the Conservatives were re-elected. This would have included $750 million over two years, followed by an annual ongoing fund of $1 billion to help finance public-private partnerships to pay for projects and upgrades with a combination of public and private investment.

PTIC provides funding to support infrastructure projects of national, regional and local significance that contribute to objectives related to economic growth, a clean environment, and stronger communities. To support a wide range of infrastructure needs, it is divided into two parts: the first is $9 billion for projects that are nationally and regionally significant and are predominantly medium- and large-scale in nature; and the second is $1 billion for projects in communities with fewer than 100,000 residents.

PTIC is an allocation-based program providing $250 million to each of the thirteen provinces and territories, with the balance of the allocations disbursed on an equal per capita basis over ten years. To access these funds, provinces must

prioritize their infrastructure requests (with an emphasis on eligible costs and timing) for submission to the federal government. All submissions must satisfy the terms and conditions of the PTIC and are application based. Eligible projects include those of both provincial and municipal governments, with municipal requests channelled through provincial submissions. Generally speaking, projects will be federally cost-shared. The maximum federal contribution is 50 percent for provincially owned highways and major roads, as well as public-transit projects. For municipal projects, the cost sharing is generally one-third for each level of government. The maximum federal contribution is 25 percent for projects with for-profit private-sector proponents as well as projects procured as P3s. For projects located in the Northwest Territories, Yukon and Nunavut, the federal government will fund up to 75 percent of total eligible costs, including for P3 projects. For projects with a for-profit private-sector proponent, however, the cap would be 25 percent.

The NIC is a merit-based, application-driven program with no predetermined provincial or territorial allocations. This program funds projects of national interest. Eligible projects are limited to those that provide the greatest economic impact under the following seven categories: highways and major roads, public transit, rail infrastructure, local and regional airports, port infrastructure, intelligent transportation systems (ITS), and disaster mitigation infrastructure. Thus, apart from the last category, targeted projects are in the transportation area.

Eligible recipients need not be a municipality or a province or an agency of these, but they could be. They could also be a private-sector body, including both for-profit and not-for-profit organizations, a Canada Port Authority, or International Bridge or Tunnel Authority. Generally speaking, projects will be federally cost-shared on a one-third basis unless they are P3 projects, in which case the maximum share is 25 percent.

The maximum federal contribution under NIC is 50 percent of eligible costs for provincially owned highways and major roads, as well as public-transit projects. The maximum contribution is 25 percent for projects with for-profit private-sector proponents as well as projects procured as P3s. For projects located in the Northwest Territories, Yukon, and Nunavut, the federal government will fund up to 75 percent of total eligible costs, including for P3 projects. For projects with a for-profit private-sector proponent, however, the maximum would be 25 percent.

The GTF is a per capita grant awarded to provinces, which in turn allocate the money to municipalities. In British Columbia and Ontario, the province has transferred the allocation chore to the Association of Municipalities. One federal constraint on the use of these funds is that they must be spent on eligible projects, of which there are seventeen categories; municipal buildings and emergency medical facilities are specifically excluded, as are land costs and soft services. Of these funds, 90 percent are spent on water, sewer, wastewater, local roads and public transit, that is, projects of a purely local nature. To ensure that funds meet eligibility requirements, municipalities must submit reports on the project to the provincial

authority, which in turn forwards them to the federal government. Very briefly, the GTF is up-front funding and back-end approval for the federal government.

With the possible exception of an NIC transfer, the federal government does not deal directly with municipalities, although it does exercise influence over the types of municipal infrastructure projects that can be supported by the GTF (even though the allocation is equal per capita).

In summary, the federal government provides support for provincial and municipal infrastructure spending directly through the NBCF and GTF and indirectly through equalization, CHT/CST, and specific grants. Moreover, there is no constraint on provinces in using their own-source or unconditional grant revenue to finance infrastructure.

Provincial transfers to municipalities show considerable variation. In addition, funding for municipal infrastructure differs considerably from that for federal and provincial infrastructure. For municipal infrastructure financed by borrowing, debt service is included as an item in the municipality's operating budget. Thus, municipal infrastructure spending is constrained by a municipality's capacity to borrow, which is in turns affected by its tax capacity, by provincial and federal grants, and also by direct financing of infrastructure by the province. User fees are also an important source of ex post funding for capital projects, especially for water, sewer, solid waste, urban transit and transportation. As well, specific property-based charges are used to finance specific infrastructure projects. These include special assessments and local improvement charges, development charges or capital-cost contributions, value-capture levies, and occasionally tax-increment financing (Kitchen and Tassonyi 2012, 12). Provincial grants to municipalities are also used to finance infrastructure. Some of these have equalization features, such as revenue equalization based on property tax revenues, equal per capita components, and ad hoc needs elements, such as rural-urban, north-south. Provincial grants can also be specific to certain items, such as water, sewer, solid waste, transportation, and transit.

FISCAL FEDERALISM AND INFRASTRUCTURE: BASIC CONSIDERATIONS

What do principles of fiscal federalism tell us about the financing of infrastructure? Our starting point is the principle of subsidiarity, which says that, in the absence of compelling arguments to the contrary, the provision of public goods and services should be the responsibility of the lowest level of government. This decentralization default position characterizes bottom-up federations like Canada that have formed from previously separate jurisdictions, and characterizes reasonably well the actual division of responsibilities for infrastructure among the three main levels of government. Given the highly decentralized provision of infrastructure in Canada,

what arguments exist for upper-level involvement in lower-level financing and the provision of infrastructure?

Federal Role in Financing Provincial Infrastructure

Starting with the federal-provincial scenario, there are a number of potential reasons for federal involvement in provincial infrastructure provision. The classic argument is that provincial infrastructure spending has spillover effects on neighbouring jurisdictions, and federal grants are a way of dealing with this. However, this argument can cut both ways, because spillovers can be positive or negative. Beneficial spillovers occur to the extent that infrastructure projects benefit residents or firms in other provinces. An obvious example is transportation facilities that can be used by all Canadians. Others include abatement expenditures on cross-border pollution, educational and training institutions whose graduates might reside in other provinces, and health facilities that serve out-of province residents. Some of these spillovers can be addressed by specific shared-cost programs that incorporate conditions like harmonization of service provision and service standards. Some can be addressed by block grants that have broad conditions attached, such as mobility. It is often possible that financing by user fees serves to internalize the benefits to non-residents, as in the case of toll bridges and roads (Confederation Bridge linking Prince Edward Island and New Brunswick, Champlain Bridge in Montreal, Highway 407 through the Greater Toronto Area), post-secondary education institutions (university and college fees), and out-of-province health reimbursements from one province to another.

Infrastructure spending can have negative spillover effects to the extent that they attract persons and businesses from other provinces. This is the analogue of tax competition on the expenditure side. Just as provinces have an incentive to reduce tax rates or offer tax subsidies to attract business, so they have an incentive to provide business services and infrastructure to attract business, that is, to "province-build." Although the benefits of fiscal competition are sometimes stressed in the classical fiscal federalism inspired by Tiebout (1965) and more recently by those who see fiscal competition as a discipline device (Edwards and Keen 1996), fiscal competition also leads to beggar-thy-neighbour policies. These problems can be exacerbated if provinces have highly differing fiscal capacities. For example, one of the consequences of the uneven access of provinces to natural resource revenues is that the resource-rich provinces are able to use their fiscal advantage to proactively build their provinces, partly at the expense of others, by low taxes and high levels of public services, including infrastructure (Boadway, Coulombe, and Tremblay 2015). The term "Alberta advantage" captures that effect.

The point is that one cannot presume that lower levels of government have an incentive to under-provide infrastructure. On the contrary, they have strong

incentives to use infrastructure spending as a way to foster local economic development. Indeed, good infrastructure is a prerequisite to making a locality attractive for business, and to retaining business and skilled labour that is already there. If anything, there is a payoff to competing aggressively against other provinces. The federal government can do little to counter the adverse effects of province-building. However, it can be mitigated by ensuring that all provinces have comparable fiscal capacities to provide needed infrastructure, which is the task of equalization and, to a lesser extent, the CHT and CST programs.

A broader argument can be made for a federal interest in infrastructure that derives from Section 36(1) of the Constitution, one that has recently been emphasized by Dodge, Burn, and Dion (2010). As mentioned, that section commits the federal and provincial governments jointly to regional development, equality of opportunity and the provision of reasonable qualities of essential public services. This commitment can be thought of as underpinning the use of social transfers, but it could also be thought of as providing a rationale for regional development policies, including the provision of infrastructure. Dodge et al. saw this as a vehicle for addressing the disadvantages faced by provinces that were not resource-rich, and as an alternative to equalizing natural resource revenues. The federal government does pursue regional development policies using other instruments. For example, its various regional development agencies, such as ACOA, CED, CanNor, FedDev Ontario, FedNor and WD, provide discretionary finance for businesses willing to invest in targeted regions. As well, it has sometimes used tax-transfer mechanisms such as investment tax credits and preferential Employment Insurance benefits to favour high-unemployment regions.

It is interesting that the NIC infrastructure grants provided under the NCBF are intended to be for projects of national significance. Be that as it may, it is clear that both equalization and social transfers, which serve the commitments of Section 36, can be used for infrastructure at the discretion of the provinces. The transfers could be readily revised to address some of the outstanding horizontal imbalance issues, for example, by conditioning the CHT/CST on provincial fiscal capacities, including natural resource revenues. It is not clear why additional federal transfers earmarked for infrastructure are needed, given that the provinces have ample incentive to invest in infrastructure.

It might be argued that there remains a significant vertical imbalance in the federation that constrains the ability of the provinces to finance infrastructure. That is, even though the provinces have access to all the major revenue sources, it is difficult for them individually to raise taxes, especially given their projected expenditure requirements in the near future. Given that and the relatively high levels of debt that they already have, it is also more costly for them than for the federal government. To the extent that this is the case—and that is an open question—the appropriate way to address a vertical imbalance is through the transfer system rather than through infrastructure grants.

Provincial Role in Financing Municipal Infrastructure

What is the provincial government's role in municipal infrastructure provision? This situation differs significantly from the role of the federal government. Unlike the provinces, municipal governments have limited access to own-source revenues and debt finance and are, in most cases, subject to oversight by the province on major infrastructure projects. The actual delivery of local infrastructure is executed by municipal governments, as the principle of subsidiarity would recommend, but they may not have full discretion over deciding on and financing infrastructure projects if they are partially funded by provincial or federal transfers.

Part of the rationale for provincial-municipal grants for infrastructure is similar to the federal-provincial case. There may be spillovers, both positive and negative, from municipal investments, and the provincial grants, regulations and supervisory oversight serve to ensure that interests of those residing elsewhere are considered. In some cases, this might entail specific grants that induce municipalities to undertake projects that serve a broad interest, such as transit investments, schools, hospitals, conservation areas, water and sewage plants, and so on. More than simple financing may be involved if it is important that the projects be harmonized with those in other municipalities. In some provinces, these spillovers have been internalized, at least in part, by amalgamation of municipal governments.

Much municipal infrastructure benefits mostly residents and businesses in the municipality, and as such there is no systematic incentive to invest too little. On the contrary, as with provinces, municipalities stand to benefit from infrastructure as a means of enticing persons and businesses to locate there. Any shortage of municipal infrastructure investment must therefore be due to other reasons. One is that with the ongoing tendency for urbanization and the fact that migrants from other provinces and immigrants from abroad mostly settle in urban areas, there is a continual need to expand and upgrade infrastructure to accommodate the increased population. This causes a temporary backlog of infrastructure needs that requires time to remedy.

A much more compelling constraint on municipalities that identify the need for new or replacement infrastructure is a shortage of discretionary finance, or what they perceive to be a shortage. Municipalities rely almost entirely on property taxes and user fees for own-source revenues, plus whatever transfers they receive from senior governments. Property taxes and user fees are good sources of revenues for financing many local services (McClure 2001; Bird and Slack 2015, this volume, 2; Kitchen 2013; Kitchen and Tassonyi 2012, 11). In fact, a recent study on Alberta cities argued that the property tax is the only tax needed to finance municipal services. Furthermore, if the education portion of the property tax were eliminated, cities would have more than enough tax room to finance their services now and well into the future (McMillan and Dahlby 2014). A recent study on the City of Toronto's finances noted that property tax revenues have grown less than inflation from 2000

and that the tax burden per household has fallen over this time (Slack and Cote 2014). A more recently published study on the Greater Toronto Area (Tassonyi, Bird, and Slack 2015) concluded that there is room to increase property taxes in most municipalities in the GTA. A quick calculation of effective tax rates (property taxes as a percentage of the assessment base) for the ten largest cities in Ontario over the past four years shows a slight decrease in the overall effective tax rate in all but one city.[9] There is no question that the property tax could generate more revenue than it currently does in virtually every city in Canada: politicians could simply raise the tax rate. Furthermore, there is no evidence to suggest that raising the tax rate would lead to serious financial constraints, bankruptcy or revenue loss.

The property tax is not foolproof, however. One can argue that not only is it relied on too heavily in Canada[10] for financing things like education and social services, but also, since property taxes are not profit-insensitive, that it may distort the investment decisions of firms. Even in the case of residents, since property taxes do not differentiate between site value and property value, they can discourage property improvement.

The real question, it seems to us, is not whether the property tax is adequate or inadequate, but whether this is the best tax for funding all municipal services, especially those provided by large cities. Provincial offloading of expenditure responsibilities, additional services for an aging population, and the fact that most infrastructure assets—their construction, maintenance and expansion—have become municipal responsibilities, have all contributed and will continue contributing to an increased burden on the property tax. It is this increasing burden, and not any perception of intrinsic deficiency, that prompts the recommendation that big cities ought to have access to a range of taxes[11] so that they can choose the best combination for funding the wide range of services they now provide. Precedents for an initiative of this sort[12] are provided by cities and metropolitan areas in many other countries. Additional taxes would give cities more flexibility in responding to local conditions such as changes in the economy, evolving demographics and expenditure needs, changes in the political climate, and other factors. This strategy would make the overall local tax structure more flexible, permitting elected politicians to choose taxes that best fit local conditions and circumstances. It could generate enough revenue to upgrade local infrastructure and provide public services while minimizing fiscal competition.

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9. Calculated from data in the annual Municipal Financial Information Returns, Provincial Ministry of Municipal Affairs and Housing, Toronto, Ontario.

10. Property taxes as a percentage of GDP are higher in Canada than in any other OECD country. Calculated from data in OECD (2012), Tables 77, 80, 81, and 83.

11. For a detailed discussion, see Kitchen (2015b).

12. New taxes, it must be noted, would require provincial approval and possibly new legislation.

Given these considerations, arguably the main issue facing municipalities is a perceived vertical fiscal imbalance with respect to upper levels of government. Provinces make transfers to municipalities, but the question is whether they are adequate in size and suitable in structure. Unlike federal-provincial transfers, provincial-municipal transfers are not as systematically equalizing in all provinces. The consequence is that municipalities with the most needs and costs are generally the most financially stretched, and these may well include those with the largest infrastructure needs, such as those arising in the larger metropolitan areas. To the extent that a vertical fiscal gap exists, it can be traced to two key issues. One has been the tendency for provincial governments to off-load to the municipalities, without adequate fiscal compensation, responsibility for the provision of public services that are more provincial than municipal in nature. These include things like social services and education that have significant redistributive or social insurance characteristics, and are thus poor candidates for property tax financing. While the actual delivery of these services might be better done at the local level, their characteristics suggest that the province should be a significant financial contributor. The other issue is the relationship between a vertical imbalance at the municipal level and that at the federal level. The tendency for the federal government to remedy its fiscal deficits by reducing intergovernmental transfers to the provinces has its parallel in the provinces reducing their transfers to municipalities. There is some evidence that aggregate provincial-municipal transfers are correlated with aggregate federal-provincial transfers. For example, since the early 2000s, the former have been roughly $10 billion less than the latter, though with some fluctuation (Canadian Tax Foundation 2013, Table A2).

Finally, lack of fiscal discretion at the municipal level might detract from the ability of municipalities to respond to infrastructure needs in a timely fashion. This lack of discretion is partly attributed to the oversight exercised by the provinces over municipal capital spending, which is understandable given the potential for soft-budget constraint problems and the potential need to bail out municipalities that have overspent.[13] It could also be attributed to the limited access that municipalities have to local tax sources. This situation could be ameliorated if municipalities, especially the larger ones, had access to more flexible own-source revenues. Furthermore, both theory (Weingast 2009) and empirical evidence (Borge, Brueckner, and Rattso 2013) support this: increased local fiscal authority leads to increased local fiscal accountability.

13. There is evidence suggesting that local governments subject to hard budget constraints tax and spend more sensibly than those not subject to such constraints.See Rodden, Eskeland, and Litvack (2003).

Federal Role in Financing Municipal Infrastructure

A final issue is whether the federal government should make direct transfers to municipalities, bypassing the provinces. The argument in favour is that if a vertical imbalance exists for large municipalities and it constrains their ability to finance infrastructure, the federal government is better able to deal with that imbalance than are the provinces, which may themselves be fiscally constrained. Moreover, to the extent that one regards the cities as the engines of growth and innovation, and municipal infrastructure as a necessity for exploiting their potential, large municipal infrastructure investments are of national interest since they spur national growth and their benefits extend well beyond the city involved. A counter-argument is that municipalities are creatures of the provinces and are governed by provincial constitutions. This relationship includes oversight and ultimate responsibility for municipal financial sustainability. Direct dealings between the federal government and municipalities would undermine municipal accountability to the province, and accountability between the municipality and the federal government would be constrained by the distance between them and the absence of day-to-day interaction. As well, direct transfers from the federal government to the municipalities are not necessary to achieve national objectives. Given that provinces are particularly experienced at dealing with municipalities, and that large municipalities have direct input into provincial political decision making through proportionately larger influence in provincial legislatures, transfers made via the province for infrastructure projects that are deemed to serve national interests can be as effective and more accountable than those that bypass provinces. In any case, relatively few municipal infrastructure projects can be viewed as being of national benefit over and above provincial-local benefit.

A Cautionary Note

Two issues are addressed here. Both deal with municipalities, where the bulk of the infrastructure exists. One is a comment on the importance of properly pricing or taxing for the use of municipal services and the impact that this has on the demand for infrastructure. The other is a comment on the growing interest in or direction by senior governments (such as in the 2015 Federal budget) to consider public private partnerships as a vehicle for providing municipal infrastructure.

Pricing/taxing of municipal services. Recent reports and media coverage emphasizing the size of the infrastructure deficit must be treated with caution, especially since none of this discussion has attempted to estimate what the real deficit would be if municipal governments properly priced or taxed for their services. Efficient pricing/taxation exists when user charges or user-fee type taxes take into consideration cost differentials attributed to economies of scale, capacity constraints,

differential demand in peak and non-peak periods, when second-best circumstances are prevalent, and when externalities exist (Kitchen and Tassonyi 2012, 12). Ultimately, the objective in setting efficient fees/taxes should be to establish a clear link between services received and the charge or tax for them. When this link is not there—and it almost never is—services are underpriced or undertaxed, leading to over-consumption and a larger demand for infrastructure than is efficient or necessary. Furthermore, when this excess demand forms part of the request for infrastructure funds from senior levels of government, the request is difficult to justify and support. The upshot of this might very well be that infrastructure grants, where they are given, should be conditional on the implementation of efficient pricing and taxation policies at the municipal level.[14]

Public-Private Partnerships. Public-private partnerships (PPPs or P3s) are contractual arrangements between the public sector and a private provider. Unfortunately, they are often viewed by politicians as a way to raise money for cash-strapped governments. Such enthusiasm, however, must be tempered with the reality that P3s are not a source of free money since the private partner must be repaid for any financing it provides.

Policy-makers and practitioners generally acknowledge that P3s can generate significant efficiencies, better cost controls, stronger operational knowledge, and greater operational flexibility when used to deliver projects that have passed a rigorous and thorough value-for-money assessment (VfM). A VfM compares the net present value (NPV) of the P3 option with the NPV of a comparable project delivered through conventional procurement methods. While not a straightforward or easy task, the VfM is intended to capture all quantitative and qualitative factors affecting both costs and benefits.[15] A critical issue in this calculation is the way in which risks are assigned to the public and private operators.

At least two survey papers have examined the success of a number of P3s in Canada. One that included ten case studies of P3s across Canada concluded that "Canadian governments have sometimes found it difficult to effectively reduce either their total costs (that is, the sum of production and transaction costs) or their budgetary risk exposure (by transferring revenue risk) through the use of P3s" (Vining and Boardman 2008, 11). This led the authors to conclude that P3s are not socially desirable for all public infrastructure projects, but may work well under certain circumstances: for example, where governments have not attempted to transfer revenue risk (uncertainty over future revenue streams) to the private sector; where projects have required specialized knowledge that the public sector lacks; and where governments have been able to transfer construction risks (cost

14. Some of these initiatives would require provincial agreement and assistance.

15. Partnerships Canada is a federal agency that assists federal infrastructure authorities in traversing the tricky P3 terrain, including the calculation of VfM assessments. Infrastructure Ontario performs the same role for potential P3s at the provincial and municipal level.

overruns and construction delays, for example) at something close to a fixed price (Vining and Boardman 2008, 11).

A second, more recent study conducted a VfM assessment for 28 provincially approved P3 projects in Ontario from 2007 to 2010 (Siemiatycki and Farooqi 2012). This study noted that the base cost of P3s was, on average, 16 percent higher than conventional tendered contracts. The higher cost was attributed to higher interest rates paid by private borrowers and a premium for taking on greater project risks arising from potential cost overruns, construction delays, and so on. Transaction costs for lawyers and consultants added another 3 percent to private-sector costs.

Conventional government procurement practices also face a number of risks. As with P3s, these include cost overruns, construction delays, design flaws, and fluctuating revenues. To account for these risks and to attempt to establish a level playing field for comparative purposes, a risk premium that averaged 49 percent of base costs was added to the more conventional alternatives. It was this risk premium that drove the VfM in favour of a P3 for each of the 28 projects. A major concern here is that there is no empirical evidence to support such a large risk premium. The authors emphasized this concern, which has also been highlighted by Ontario's auditor general (McKenna 2012). Hence, no one really knows whether Ontario's taxpayers have been and are getting the best value for their money under P3s.

Canadian experience with P3s is relatively limited by international standards. Based on existing experience, municipal infrastructure projects that may be suitable for a P3 include roads and public transit, water and wastewater treatment systems, and solid waste disposal, providing they can pass a rigorous and carefully constructed VfM assessment. A P3 may be most appropriate when outputs can be clearly defined, where risks are correctly assigned to each party, where proper incentives can be introduced for encouraging private partners to get better value, and if there is clear communication and accountability between the private and public partners (Ugate, Gutierrez, and Phillips 2012). Where P3 contracts are properly structured and based on performance measures, they can lead to improved local governance including increased accountability, transparency, and value for money.

Because P3s are monopolistic in nature, there is a role for government in monitoring their behaviour. Governments should set the terms and conditions for service delivery, funding, and quality of service, and should establish performance standards or measures. Government could even provide the pricing structure to be used for services provided by the infrastructure (volumetric pricing for water and sewers, tolls and other charges for roads and public transit, user fees for solid waste disposal) or set up a price regulation or monitoring system. Letting a private partner operate a P3 can raise transaction costs because of the need to monitor service quality. However, this arrangement has the potential advantage that user fees or prices are more politically acceptable because the public expects private-sector services to be priced (Vining and Boardman 2008, 38). These prices should be regulated in such a way that they do not prevent flexible or innovative pricing structures.

ISSUES WITH THE CURRENT ARRANGEMENTS FOR FINANCING INFRASTRUCTURE

The discussion in the previous section suggests some key issues that should be considered in crafting a system of intergovernmental fiscal relations that takes into account infrastructure needs and financing. An over-arching issue concerns the adequacy of the current system for addressing ongoing and future infrastructure needs. As we have mentioned, the federal government already provides virtually unconditional and fungible equalization and social transfers to provinces that can be used both for their own infrastructure spending and for supporting municipal infrastructure spending. In addition, some specific federal grants are designated for infrastructure projects of national interest (e.g., Trans-Canada Highway). As mentioned earlier, there are also the NBCF and the GTF fund that earmark federal transfers to infrastructure, much of it purely local in nature. Given all of these, are there arguments for a permanent and substantial infrastructure grant to the provinces and municipalities?

Some might argue that equalization and CHT/CST are only based on revenue capacity and do not take account of infrastructure spending or other needs. However, national average revenue-raising capacity, which determines the aggregate size of equalization, reflects national average spending of all kinds financed by the revenues. Thus, it implicitly includes provincial tax revenues devoted to financing infrastructure. If one took needs and/or costs into account in calculating equalization, this would not affect the total equalization amount, although it would affect its allocation among provinces. It is true that debt financing is not included in equalization, and debt may be used to finance infrastructure. However, debt is just postponed taxes, which eventually enter equalization. Similarly, CHT/CST transfers are unconditional and are meant to support both current and capital spending on health, social assistance, and post-secondary education. The upshot is that a case for an additional infrastructure grant cannot be based on the idea that infrastructure spending is not taken into account in equalization/CHT/CST.

There may still be an issue of whether total transfers to the provinces are adequate, given their share of tax room relative to their spending obligations. The concept of vertical fiscal imbalance is necessarily an ambiguous one, given that in principle both provincial and federal levels of government have full discretion in setting their own tax rates. At the same time, the greater the tax room occupied by one level of government, the more difficult it might be for the other to raise tax rates, as both are tapping into a common pool of potential revenues. Vertical imbalances evolve over time and can reflect both longer-term factors like the relative growth rates of provincial versus federal expenditures and short-run factors like precipitous reductions in federal-provincial transfers in response to fiscal shocks. In either case, a temporary vertical imbalance may be created that can be addressed by either increased provincial tax effort or increased transfers.

In current circumstances, the provinces are fiscally constrained because of the rate of growth in spending on health, education and social services, which is reflected in a higher growth rate in the debt-to-GDP ratio when compared with that of the federal government. At the same time, the federal government has reduced tax rates, leaving more tax room for the provinces. The provinces could increase tax rates and deal with any vertical imbalance they face. The economic question is whether it is desirable to shift tax room to the provinces as opposed to increasing federal transfers as a way to address an imbalance. Opinions differ on that. On the one hand, requiring provinces and municipalities to meet incremental expenditure needs by increasing own-source revenue entails an element of political accountability that might be missing if transfers were used. On the other hand, further decentralization of tax room exacerbates horizontal imbalance, and makes it more difficult for the federal government to meet its equalization commitment. It also runs the risk of threatening the sustainability of tax harmonization. Another sometimes overlooked consequence of decentralized revenue-raising is that it reduces the ability of the federation to insure against regional shocks. As is evident nowadays, this capacity distinguishes a federation from an economic union such as the EU.

These arguments might suggest some balance of own responsibility and transfers to meet vertical imbalance problems. For our purposes, the fact that provincial governments and their municipalities are fiscally constrained may make it particularly difficult to meet infrastructure needs if they are crowded out by growing expenditures on health and other public services. That does not necessarily mean that an infrastructure-specific grant is called for as opposed to remedying any vertical imbalance by a mix of federal transfers and own-source revenues.

The existence of horizontal imbalance also results in particular strains on infrastructure spending for the have-not provinces. Because the equalization system only applies to them and includes only half of resource revenues, the provinces with above-average fiscal capacity have a significant fiscal advantage over the have-not provinces. This disparity constrains the ability of the latter to meet infrastructure spending by increasing own-source revenues. It would be difficult to address this issue directly since the equalization system cannot be turned into a net system. However, the GDP cap, which applies selectively to the have-not provinces, could be eliminated, and the CHT/CST system could be more equalizing by making transfers contingent on fiscal capacity rather than being equal per capita.[16]

There remains an argument that some infrastructure investments delivered by the provinces serve a "national purpose," and, even if they are most efficiently provided by the provinces, they should be supported by federal grants. The grants would encourage such projects to be undertaken, and would ensure that they are designed to take national benefits into account. Determining what is in the national interest is not an easy or obvious matter. The national interest might be due to spillover

16. This has been proposed by Courchene (2010).

benefits to other provinces or municipalities. Examples such as transportation projects, communications, environmental protection and education institutions come to mind. Even if projects are in the national interest, it may be efficient for them to be provided by the provinces, since they are closer to the ground and better able to know local needs, to solicit contracts, and to monitor the investment. In such cases, the provinces undertaking the investment can be the main beneficiaries, so whether the project should be shared-cost is an issue. Shared-cost financing is a way to encourage accountability.

Another argument for federal support or encouragement is that there might be a systematic tendency for lower-level governments to under-provide infrastructure because of fiscal competition or short-sightedness. We have suggested that this is an over-stated concern. While tax competition puts downward pressure on tax rates on mobile tax bases, the opposite is the case for infrastructure. To the extent that infrastructure attracts businesses from other jurisdictions, there is a negative spillover: a given jurisdiction does not take account of the adverse effect on other jurisdictions of businesses relocating (i.e., the loss of tax revenue). Resource-rich provinces provide a good example of that. Alberta explicitly tries to attract businesses not just with low tax rates but also with public infrastructure. Thus, there is no argument based on fiscal competition for infrastructure to be under-provided by provinces and municipalities.

It is possible to interpret "the national interest" in a broader sense: Infrastructure investment might be seen as contributing to regional development in fulfilment of the joint commitment of Section 36(1). In this case, the allocation of projects would somehow reflect regional development objectives and need. Some have argued (see, for example, Dodge 2012), that federal infrastructure spending should be considered as a proactive alternative to equalization to encourage have-not regions to grow and be less dependent on transfers. More generally, this strategy has been seen as a partial antidote to the inefficient interregional allocations of resources induced by natural resource shocks (Dutch disease) and to province-building by resource-rich provinces that have an incentive to use resource revenues to attract business by investing in local infrastructure and keeping taxes low.

The provincial premiers argue that there should be a permanent federal infrastructure grant that provides financing to the provinces to meet predicted infrastructure needs. The communiqué of their Winter Meeting, 30 January 2015, states:

> Investments in public infrastructure support economic growth and create jobs. Premiers called on the federal government to join them by providing additional funding beyond the Building Canada Plan, to support investment in provincial and territorial infrastructure funding priorities which will advance our economic competitiveness now and well into the future. Premiers agreed that federal infrastructure programs must follow a "base-plus per capita" formula that will allow more strategic investments by all jurisdictions. Premiers also discussed the importance of trade infrastructure and called for increased federal investment in gateways to support greater international trade in key markets. (Council of the Federation 2015)

There is little justification for such a federal initiative apart from the idea that infrastructure supports economic growth, which could be viewed as a "national purpose." The issue is whether there needs to be an infrastructure-specific grant over and above the all-purpose grants that already exist. Provincial governments already receive unconditional transfers that can be used for capital spending as they see fit, and they also have access to the same revenue sources as the federal government. An infrastructure grant could simply crowd out provincial infrastructure spending that would otherwise occur, or that would occur if the provinces had sufficient revenue from own sources and general transfers. We have suggested that there might be a vertical imbalance in the sense that federal transfers are too small given the share of revenues (e.g., income tax) they currently claim, a proposition that is evidenced by the fact that provincial debt/GDP is rising while that of the federal government is falling. Moreover, because provincial program spending is rising more rapidly than that of the feds because of health care especially, infrastructure is being crowded out along with other programs. While this assessment may be valid, it does not follow that the response is to make larger infrastructure grants. One could either increase general transfers or adjust the tax room, or some combination of the two as appropriate.

Different issues arise with municipal infrastructure. As mentioned above, problems of vertical imbalance raise unique problems for financing municipal capital projects, especially given the constraints that they face on borrowing and their limited access to broad tax bases. Increasing own revenues to meet spending deficiencies is more difficult for municipalities since they rely heavily on property taxes (which are already intensively burdened, by international standards), and must get provincial approval for new revenue sources. Moreover, as a proportion of their spending, infrastructure is much more important for municipalities than for provinces, and arguably municipal infrastructure has significant spillover benefits that might warrant provincial conditional grants. Municipalities also face significant horizontal imbalances within provinces because of inadequate equalization systems.

If there is need for more infrastructure investment at the municipal level, what is the best way to fund it? Given that infrastructure spending benefits future generations and that municipalities have borrowing capacity, borrowing makes considerable economic sense. Currently, every province has an organized authority or agency that is responsible for assisting most, if not all, municipalities in issuing long-term debentures that are subsequently sold by investment dealers. In the western provinces, Winnipeg, Regina, Saskatoon, Edmonton, Calgary and Vancouver issue debt in their own name rather than through a provincial agency. Province-wide agencies[17] issue debt for the remaining municipalities in the western

17. In some provinces, these are agencies set up by the provincial government. In British Columbia, the Municipal Finance Authority is a cooperative that is owned and operated by all member municipalities and governed by a board appointed by the regional districts. It is not an agency of the province.

provinces as they do in Quebec and the eastern provinces. In Ontario, Infrastructure Ontario has been set up as a crown corporation with a mandate to manage large infrastructure projects. It operates like an infrastructure bank, offering short-term and long-term loans for eligible public-sector infrastructure projects at affordable rates. It provides access to capital market financing without fees or commissions. The length of the loan may be structured to match the life of the asset; hence there is no need to refinance over the life of the loan. Loans may be available for any depreciable asset and have been used for a wide range of projects, ranging from the construction of roads, bridges, and facilities to the acquisition of assets such as vehicles and equipment. Finally, Infrastructure Ontario offers technical expertise and assistance for municipalities about to engage in infrastructure investment. For borrowing that may not go through Infrastructure Ontario, regional governments borrow on behalf of their lower-tier municipalities as a matter of process, but the obligation to service the debt remains with the lower tiers. Lower tiers in counties and the counties themselves may borrow on their own behalf. Finally, single-tier municipalities may borrow on their own.

Restrictions vary on whether municipalities must borrow through province-wide bodies. In some provinces (Nova Scotia and New Brunswick, for example), every municipality must borrow through the province-wide agency. In other provinces, as noted above, larger cities are not required to borrow through the province-wide organization, nor do they do so.

The advantages of a province-wide body are immense. Municipalities borrow from or apply for funds from the province-wide authority, which in turn totals up all the requests for local funds and issues longterm debentures against the authority itself. In some provinces, these debentures are guaranteed by the province. When the proceeds are received from the sale of these debentures, the funds are dispersed to the requesting municipalities, usually under a loan agreement with the borrowing municipality. The system is relatively immune to soft-budget constraint problems. For example, there has not been a default in municipal borrowing for at least 50 years.

Recently, however, it has been suggested that the federal government could undertake this borrowing because it faces lower interest rates than those paid by the existing municipal/ provincial bodies (Curry 2015b). If this is true, this approach may be appropriate providing the federal government could act as an arms-length banker in dealing with the municipal sector. In other words, the federal government would borrow funds to finance municipal infrastructure, and the municipal sector would repay this debt just as they would repay loans made by private investors. However, it is hard to imagine how this could occur without the federal government exercising approval and oversight over the municipal projects it finances, much as the provinces now exercise control. It is not at all clear that it would be conducive to accountability to have the federal government influencing municipal infrastructure investments.

Three other sources of finance for municipal infrastructure can be contemplated. Additional tax sources could be made available to municipalities, at least large ones (Kitchen 2015b). For example, they could piggyback onto the provincial personal income tax or onto a provincial tax base that is more narrowly defined, such as the provincial gas tax, with revenues dedicated to roads and transit. While this would create more fiscal capacity for some municipalities, it would also result in some fiscal imbalance between large and small cities. In principle, this latter issue could be addressed by provincial-municipal equalization, although this would not be straightforward.

A second source of revenue would be to expand and improve user fees. Current practice in setting user fees frequently deviates from that which is fair, efficient and accountable. The tendency is to set fees to generate revenue rather than to allocate resources to their most efficient use. Failure to introduce efficiency considerations (price equals marginal cost) into the pricing structure or to entertain in any serious fashion suggestions for expanding the role for user fees has been defended on grounds that they are regressive. This claim, however, is about as relevant as the claim that milk prices and movie tickets are regressive. This is not to imply that income distribution issues are unimportant. Clearly, they are very important, but they should be handled through income distribution programs that target the poor rather than by changing or distorting prices, a practice from which the rich frequently benefit more than the poor.

Failure to price properly has created a good deal of unplanned and implicit income redistribution, much of which would be unacceptable if it were made explicit. For example, the tendency to charge a fixed price for water, regardless of quantity consumed, on the premise that fixed-income earners (poor and seniors) could not afford to pay, provides an implicit subsidy for higher-income households with larger lawns to water and more cars to wash. Similar outcomes emerge from the practice of offering discounted transit fares based strictly on age.

Failure to set prices efficiently has led to excessive demand for services, and thus to a demand for physical infrastructure that is not allocatively efficient or optimal (Kitchen 2006). All too often, inefficiently set user fees have led to overinvestment and larger facilities than would be justified if more efficient pricing practices were adopted. For financing municipal services, user fees should be adopted wherever possible. They make considerable economic sense for all water and sewer systems, solid waste collection and disposal, public transit and transportation, and much of public recreation and libraries. Raising revenues in this way would enhance municipal accountability.

Finally, there is the option of a federal infrastructure grant that would go directly to municipalities.[18] Presumably, the federal spending power would allow this even though municipalities are responsible to provinces. The administrative and

18. The GTF is earmarked for municipal infrastructure, but goes through the provinces.

accountability issues associated with the federal government dealing with municipalities would be immense (unless the transfers were unconditional). The federal government is not as well placed as the provinces for determining municipal needs. To the extent that there is a municipal infrastructure deficit (which is unclear), and to the extent that the provinces are fiscally constrained, there may be a vertical imbalance among the three levels of government, in this case an imbalance between the federal government and the provincial-municipal levels combined. This could be addressed by some combination of unconditional transfers from the federal government to the provinces, and from the provinces to municipalities, and by making more revenue room available to lower levels of governments. The provinces are better placed to finance municipal infrastructure than is the federal government.

In addition to any aggregate infrastructure deficit that may exist at the municipal level, there may be systematic shortages in some jurisdictions relative to others. Needs for infrastructure may differ across jurisdictions. In principle, this could be addressed by a needs-based component in equalization. In some countries, needs equalization is often applied at the municipal level, even if it is not at the provincial or equivalent level. Examples include Switzerland, Germany, South Africa, and the Scandinavian countries. Needs-based equalization can be very complicated, as in Australia where needs are estimated by complicated and opaque statistical techniques. However, simpler and more transparent methods can be used, as the Swiss case illustrates. A simple and transparent method for designing a municipal equalization system is outlined in Supplement B.

IMPLICATIONS FOR INTERGOVERNMENTAL FISCAL ARRANGEMENTS

Several general points come out of the foregoing discussion. One is that all three levels of government have ample incentives to invest in needed infrastructure and to maintain existing infrastructure, and all three have the constitutional right to provide infrastructure within their own boundaries. Indeed, if anything, fiscal competition arguments would suggest that sub-national governments have an incentive to overinvest in order to attract businesses and skilled persons to their jurisdictions. The exception to this occurs when provincial or municipal infrastructure projects provide spillover benefits for residents in other locations, or when the infrastructure contributes to national objectives, such as those laid out in Section 36(1) of the Constitution.

Another relevant point is that most provincial infrastructure needs can be financed out of own-source revenues, borrowing and unconditional transfers (equalization, CHT/CST). The formula for equalization grants to the provinces takes both provincial and municipal revenue capacity into account, and makes no distinction between revenues that are used to finance current expenditure and those used for capital

spending. Moreover, both equalization and social transfers are fully fungible, and are intended to be used for current and capital spending. Similarly, most municipal infrastructure projects can be financed by own-source revenues, borrowing, and provincial transfers.

To the extent that there is a provincial and/or municipal infrastructure deficit, this reflects a vertical imbalance; that is, given the spending responsibilities of all levels of government, intergovernmental transfers are insufficient given the way in which tax room is divided between the levels of government. A deficiency in infrastructure indicates tight fiscal constraints and sub-national debt levels rather than a choice to forego infrastructure spending in favour of other types of spending. A vertical fiscal imbalance can best be addressed by some combination of unconditional transfers from the federal government to the provinces, and from the provinces to municipalities, and by making more revenue room available to lower levels of governments. Addressing this imbalance seems to be particularly relevant for municipal infrastructure financing, which is partially constrained by a shortage of own-source revenues.

In the case of federal-provincial transfers, while it is difficult to specify with any precision the ideal level of transfers, a couple of points can be made. One is that the equalization system is compromised by not equalizing down provinces with above-average fiscal capacity, and by the fact that the federal government does not have access to natural resource revenues, which constitute the main source of horizontal imbalance. Although it is difficult to deal with these problems adequately, several measures could mitigate their impact. First, the GDP cap could be eliminated. It serves simply to reduce the amount of equalization available to have-not provinces (and the related cost to the federal government). Second, although the CHT/CST system is generally equalizing, it too does not equalize provincial natural resource-revenue capacities, given that the source of financing is federal general revenues. This problem could be addressed by conditioning social transfers on provincial revenue-capacities.

A second point about federal transfers is that vertical imbalance grows over time because provincial spending responsibilities are growing relative to those of the federal government, while social transfers are becoming untied from provincial spending needs. One way to forestall a growing imbalance, without putting undo pressure on the provinces to increase their share of tax room, is to tie the growth of social transfers to the average rate of growth of health, welfare and post-secondary education expenditures at provincial and municipal levels of government. This could be done in a way that does not impose strong incentives for the provinces to increase their spending.

A perceived provincial-municipal vertical imbalance is more difficult to address because the extent to which the municipalities can increase own-tax revenues is constrained by their required reliance on the property tax. If the federal-provincial vertical imbalance were dealt with, that would in turn affect provincial-municipal imbalance, since provincial-municipal transfers are likely related to the financial

constraints faced by the provinces. At the same time, additional sources of revenues for municipal governments, especially large cities or metropolitan areas, should be permitted. Such sources include an improved and expanded range of user fees and earmarked user-fee-type taxes for things like roads, especially in the context of financing infrastructure investment. Municipal piggy-backing on provincial income taxes could also be permitted, at least for larger cities.

Problems of infrastructure finance could be especially apparent for municipal jurisdictions with the most need and least revenue capacity. They will be particularly reluctant to find more own-source financing for infrastructure, given that it will put them at a disadvantage relative to other communities. This problem calls for expanding and fixing provincial-municipal equalization systems, possibly by taking more of a needs-based approach than that of the federal-provincial equalization system.

Finally, there may well be cases where there is a national interest in provincial or municipal infrastructure investments. This might be the case where such projects contribute to improving either efficiency in the internal economic union, such as national transportation projects or projects that improve investment in human capital or innovation, or equity in the social union, such as by improving equality of opportunity or regional development. Identifying infrastructure projects that are of national importance is not an easy matter, and would have to be done on a project-by-project basis. These projects are better supported by project-specific grants, possibly of a cost-sharing nature, than by a broad, dedicated infrastructure grant.

CONCLUDING REMARKS

There is wide-ranging agreement that both the quantity and quality of infrastructure plays a critical role in economic activity. Similarly, there is general agreement that an infrastructure deficit exists in Canada, although there is some question as to its size and how it has been estimated. For the purposes of this paper, however, knowing the size of the deficit is not relevant. What is relevant is who should be responsible for providing this infrastructure, how should it be financed, and what influence should one level of government exert on another? These questions, along with others, have been addressed within the fiscal federalism framework as it applies to infrastructure. The following points come out of this discussion.

First, the principle of subsidiarity supports a high degree of decentralized responsibility for the provision of infrastructure to provinces and municipalities. Second, contrary to what might be supposed, local infrastructure financing and provision is not constrained by serious fiscal competition problems. On the contrary, local and provincial governments have every reason to use infrastructure investment as a way of attracting economic activity, so they should not be reluctant to engage in it. Third, the federal government already provides largely unconditional transfers (equalization, CHT/CST) to the provinces that can be used for financing infrastructure.

Arguments in defence of federal infrastructure transfers to municipalities are limited to instances where there is a clear national benefit from the infrastructure that is not being taken into consideration by the provinces. The current federal infrastructure grants to municipalities do not fit into this category.

Similar comments apply to provincial transfers to municipalities, although these tend to be more conditional and perhaps less equalizing. Finally, to the extent that lower levels of government have difficulties financing infrastructure, these might be attributed to a basic fiscal imbalance in the tax-transfer system. This can be addressed by increasing transfers (which may reduce accountability) or by making more tax room available to provincial or municipal governments. Provincial governments have significant revenue-raising ability, and further shifts of tax room from the federal government could exacerbate the large horizontal imbalances that already exist and also could jeopardize tax harmonization. However, there seems to be room for expanding and improving user fees at the municipal level and giving large cities and metropolitan areas access to additional taxes, provided that provincial-municipal equalization systems deal with any imbalances created across all municipalities within a province.

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Supplement 5A

INTERNATIONAL COMPARISON OF MUNICIPAL TAXES

This Supplement reviews the types of taxes that are available to local governments in a number of OECD (Organization for Economic Cooperation and Development) countries and shows their relative importance. It comments on the extent to which local governments in these countries have fiscal autonomy and discretion in determining the tax base and tax rates. Finally, it provides some more detailed information on local tax systems in selected countries.

PATTERNS OF TAXATION

Table 5.1 illustrates the relative importance of a range of local taxes in OECD countries in 2010. The following may be noted from the information in the table:

- Income taxation (corporate, personal and payroll) accounts for more than 50% of local tax revenues in eleven countries (column 2). In Germany, Switzerland, Denmark, Estonia, Finland, Iceland, Luxembourg, Norway, Slovenia and Sweden, it accounts for more than 70% of local tax revenue. In Australia, Canada, Chile, Czech Republic, France, Greece, Hungary, Ireland, Israel, Netherlands, New Zealand, Slovak Republic and the United Kingdom, by comparison, local governments do not have direct access to income tax revenue.
- Local sales taxes (in various forms but referring generally to taxes on goods and services that are sold) generate between 20% and 100% of total local tax revenue in eleven countries (column 3). At the other extreme, local sales taxes are non-existent or almost non-existent (generating less than 5% of all local tax revenues) in fourteen countries.
- Property taxes (column 4) account for almost 90% or more of all local tax revenue in seven countries (Australia, Canada, Mexico, Ireland, Israel, New Zealand, and the United Kingdom). By contrast, local governments in twelve countries get around 15% or less of their tax revenue from the property tax.
- Local governments in Italy and the Slovak Republic get more than 20% of all tax revenue from other local taxes (column 5), mainly on businesses.

- Column 6 provides information on the relative importance of local taxes by calculating local taxes as a percent of gross domestic product (a measure of the level of national income generated in each country). In federal countries (with federal, state/provincial, and local governments), local government taxes varied from 0.2% of GDP in Mexico to 4.6% in Switzerland with the unweighted average being 2.6%. For unitary countries (central and local governments only), local government's tax share of GDP ranges from 0.3% in Greece to 17.3% in Sweden with the unweighted average being 4.7%.
- Column 7 shows the relative importance of local taxes in the entire tax system in each country. When local taxes are calculated as a percent of all taxes (central government, state government, local government and social security funds), they range widely in relative importance. For example, in federal countries, local taxes range from slightly more than 1% of all taxes in Mexico to slightly more than 16% in Switzerland (the highest) with the unweighted average being 7.9%. For unitary countries, the range extends from a low of 1% in Greece and the Czech Republic to a high of slightly more than 35% in Sweden with the unweighted average being 11.8%.

The following observations can be made about taxation in OECD countries:

- Local governments in countries (federal and unitary) where local taxes are a relatively small percentage of total taxes generally have fewer expenditure responsibilities.
- The relative importance of local taxes in a country's overall tax system is generally less in federal countries than in unitary countries – in federal countries, state or provincial or regional governments collect some taxes which are in the domain of local government in unitary countries.
- Local property taxes play a more important revenue role (more than 57% of all taxes on average) in federal countries than in unitary countries (39% of all local taxes, on average).
- Local income taxes, on average, are considerably less important in federal countries (33% of all local tax revenues) vis-à-vis unitary countries (more than 36% of all local tax revenues).
- Local sales taxes are relatively less important on average in federal countries (6.5% of all local tax revenues) than they are in unitary countries (almost 20%). This difference reflects that the state/provincial/canton/regional level of government collects considerable sales tax revenue in federal systems; whereas, this source of revenue is more likely to be available to local governments in unitary countries.
- At the local government level, there is heavy reliance on income taxes in the Nordic countries whereas heavy reliance is placed on property taxes in countries that, in the past, were part of the British Commonwealth or significantly influenced by the British government.

Table 5.1: Relative Importance of Local Taxes in Selected OECD Countries, 2010

Countries (1)	Tax Sources as a Percentage of Total Local Tax Revenues				Local Taxes as a % of GDP (6)	Local Taxes as a % of all Taxes[5] (7)
	Income[1] (2)	Sales[2] (3)	Property[3] (4)	Other[4] (5)		
	%	%	%	%	%	%
Federal:						
Australia	0.0	0.0	100.0	0.0	1.0	3.5
Austria	61.4	9.9	15.4	13.3	1.5	3.3
Belgium	36.7	9.9	53.2	0.3	2.3	5.1
Canada	0.0	2.0	97.9	0.1	3.4	10.2
Germany	78.1	5.9	15.8	0.1	3.0	7.9
Mexico	0.3	1.7	89.0	9.0	0.2	1.2
Switzerland	84.3	1.3	14.4	0.0	4.6	15.6
United States	5.2	21.3	73.4	0.0	4.2	16.1
Unweighted average	33.2	6.5	57.4	2.9	2,6	7.9
Unitary:						
Chile	0.0	59.7	40.3	0.0	1.4	6.2
Czech Republic	0.0	48.5	51.5	0.0	0.4	1.3
Denmark	89.0	0.1	10.8	0.1	13.3	26.7
Estonia	89.6	2.5	7.9	0.0	4.7	13.4
Finland	93.6	0.0	6.3	0.1	10.8	24.4
France	0.0	25.3	64.5	10.2	4.8	10.8
Greece	0.0	21.3	78.6	0.0	0.3	1.1
Hungary	0.0	80.0	19.8	0.2	2.5	6.4
Iceland	77.4	2.0	20.6	0.0	9.2	25.5
Ireland	0.0	0.0	100.0	0.0	0.8	3.2
Israel	0.0	4.8	95.2	0.0	2.6	7.5
Italy	25.0	26.6	10.9	37.5	6.7	15.4
Japan	48.6	19.4	30.9	1.1	7.3	25.9

…continued

Table 5.1, continued: Relative Importance of Local Taxes in Selected OECD Countries, 2010

Countries (1)	Tax Sources as a Percentage of Total Local Tax Revenues				Local Taxes as a % of GDP (6)	Local Taxes as a % of all Taxes[5] (7)
	Income[1] (2)	Sales[2] (3)	Property[3] (4)	Other[4] (5)		
Unitary:	%	%	%	%	%	%
Korea	15.4	26.7	45.2	12.7	4.7	16.7
Luxembourg	92.2	1.4	6.0	0.4	1.7	4.4
Netherlands	0.0	50.0	47.6	23	1.4	3.8
New Zealand	0.0	8.6	91.3	0.0	2.4	7.2
Norway	88.5	1.4	10.1	0.0	6.2	13.6
Poland	58.2	8.3	29.6	3.9	4.4	12.7
Portugal	34.6	26.4	34.2	4.8	1.8	5.7
Slovak Republic	0.0	24.7	50.8	24.5	0.8	2.9
Slovenia	78.4	6.4	15.1	0.0	4.0	10.9
Sweden	97.4	0.0	2.6	0.0	17.3	35.4
Turkey	24.5	49.8	14.7	10.9	2.8	9.5
United Kingdom	0.0	0.0	100.0	0.0	1.8	5.1
Unweighted average	36.5	19.8	39.4	4.3	4.7	11.8

Notes:

1. Includes individual, corporate and payroll tax.
2. Includes general consumption taxes, value added taxes, specific taxes on goods and services (fuel taxes, hotel and motel occupancy) and taxes on use on goods or on permission to use goods or perform activities.
3. Taxes on property including recurring taxes on net wealth.
4. Includes a miscellaneous collection of local taxes.
5. Total includes central government, state government, local government and social security funds.

Source: OECD, Revenue Statistics 1965–2011 (Paris: OECD, 2012), Tables 77, 80, 81, and 83.

- With a few exceptions, where local taxes are a comparatively high percentage of total tax revenue and GDP, local governments tend to rely more heavily on local income taxes.
- Local governments in some countries only have access to one tax (property or income) whereas local governments in other countries have access to two or three local taxes.
- Where local taxes account for more than 10% of all tax revenue, there is no common pattern. Local governments in some of these countries have access to a wide range of taxes and others have access to only one local tax.

No definitive conclusions can be drawn about patterns of local taxation across countries nor can anything be concluded about the appropriateness of one tax over another tax. Local government access to a specific tax or taxes is dependent on a number of things including the local government's capacity to administer the tax; the types of expenditures that local government must fund; the willingness of a senior level of government to assign taxes to local government; constitutional and legislative requirements; and other factors.

Supplement 5B

A SIMPLE AND TRANSPARENT APPROACH TO EXPENDITURE NEEDS EQUALIZATION[1]

The purpose of needs equalization is to enable local levels of government to provide approximately comparable levels of public services per unit of own revenue. A suitable equalization system should have the following features:

1. Be formula driven,
2. Be relatively simple and transparent,
3. Be based on readily measurable factors that are beyond the control of local governments,
4. Be immune to strategic behavior,
5. Be legislated for a fixed period, say, five years, and be subject to renewal.

Expenditure-needs equalization is complicated because, unlike revenue which has a monetary value, expenditures provide heterogeneous public services whose quality is difficult to compare across local governments. The analogue to the Representative Tax System (RTS) used for revenue equalization would be a Representative Expenditure System (RES), which would require calculating a set of representative expenditures across localities. This would be difficult.

There is an approach that is very simple and understandable, and that relies mainly on readily available data. It approximates the RES approach in spirit, but is much easier to apply. Like the RES, it relies on what local governments actually do, but at the same time is based on factors over which individuals local government have no control.

The method works as follows. Suppose there are a variety of types of local governments varying by size and urbanization. The set of local governments can be classified by type (e.g., small urban, medium urban, large urban, rural, etc.) and expenditure-needs equalization applied to each type. Consider one of those types. The basis for calculating needs for this type of locality is the total amount of local government expenditures for this, say, G. This amount G consists of different

1. This Supplement is based on work done with Anwar Shah.

categories, such as education, social welfare, health, roads, and so on, such that $G = \sum_j G_j$ where G_j is the aggregate spending in category j.

Suppose that, for a subset of spending-categories, needs indicators can be specified that roughly reflect the need for spending in the relevant category. For education, it could be the number of school age children; for health, the number of persons aged below 5 and above 65; for welfare, the size of the disabled and welfare-dependent population; for roads, the number of kilometres of roads, and so on. Let the aggregate size of the need indicators for expenditure category j be $N_j = \sum_i \mathrm{N}_j^i$, where N_j^i is the need indicator for locality i.

The calculation of needs for expenditure category j for each locality mimics the RES approach by first calculating an aggregate expenditure-needs index as $E_j = G_j/N_j$. This is analogous to a cost per unit of needs index nationwide for this class of locality. The expenditure need entitlement for expenditure category j for locality i is given by:

$$E_j^i = N_j^i E_j \tag{1}$$

This calculation is done for each expenditure category for which needs indicators are defined.

For categories for which needs indices are not defined, denoted by G_k, equalization needs are defined on an equal per capita basis. This is equivalent to specifying the needs indicator for these categories to be the population of the locality, P^i. Needs equalization for spending category k is then simply:

$$E_k^i = P^i G_k/P \tag{2}$$

where P is aggregate population in all localities of this type. The aggregate expenditure needs equalization entitlement of locality i is then the sum of needs for all expenditure categories of types j and type k in (1) and (2):

$$E^i = \sum_j E_j^i + \sum_k E_k^i$$

The same calculation applies to all localities. Note that the sum of expenditure needs aggregated across all regions is actual total expenditures G.

Finally, the total equalization entitlement for region i is found by subtracting total expenditure needs E^i minus total revenue capacity (calculated by RTS). This can be thought of as a gap-filling calculation.

Equalization calculated in this way has some notable features.

Assuming the RTS is calculated for all revenue sources, the combination of revenue and needs equalization equalizes 100 percent of the differences among localities. In principle, total entitlements for high-income localities could be negative. However, if the vertical gap is large enough (i.e., expenditure needs are high enough relative to revenue-raising), full equalization can be achieved without requiring any negative equalization.

The absolute size of the equalization program as well as the entitlements of all localities is endogenous to the system.

The effective marginal equalization tax is 100 percent in the sense that increases in a locality's tax base reduces entitlements fully if the locality uses the national average tax rate, and changes in a locality's need index gives rise to offsetting changes in entitlements. As long as localities have limited ability to influence their need indices or their tax bases, this should not be a big problem. To the extent that incentives are a problem, it is more pronounced on the revenues than on the expenditures-equalization side. In principle, this could be addressed by equalizing revenue capacity less than fully.

The choice of types, localities, and the need indices are to some extent arbitrary and could be adjusted as time goes by.

Expenditure needs are equalized but costs are not. Whether costs should be equalized is a matter of dispute. Some have argued that costs are relevant where wage rates differ across localities. This could be addressed by adjusting entitlements by relative wage indices, although if a public-sector-wage index is used that could provide an incentive to increase wage rates.

6

DISTORTED INFRASTRUCTURE

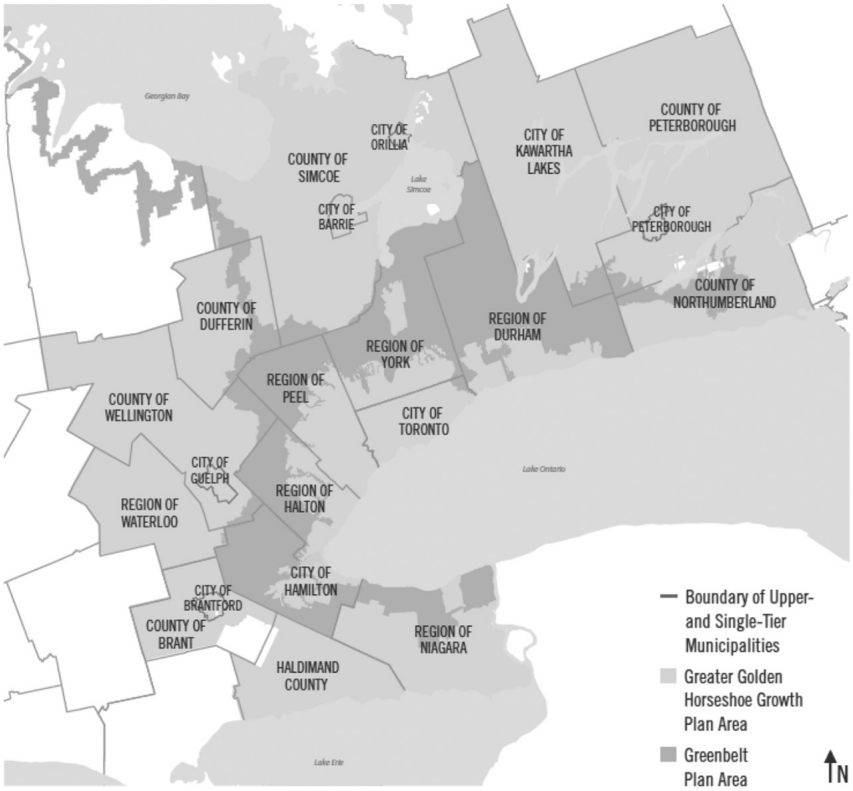
Pamela Blais

The Greater Golden Horseshoe (GGH; Figure 6.1) in Southern Ontario is expected to grow from nine million people and 4.5 million jobs in 2011 to 13.5 million people and 6.3 million jobs by 2041 (Ontario 2006). The provincial government expects to invest $130 billion on infrastructure in Ontario over the next decade, including over $31.5 billion on transit and transportation, with a significant share earmarked for the GGH to support this growth, according to the 2015 Budget (Ontario 2015).

Unfortunately, urban planning approaches have not sufficiently recognized that price systems—including "prices" set in the public sector, such as property taxes or development charges—are actively encouraging inefficient use of this infrastructure through urban sprawl and providing financial disincentives to more sustainable alternatives. Sprawl has been subsidized, while efficient forms of development are overcharged. The powerful role of pricing, and more specifically, mispricing, has not been adequately addressed in most attempts to curb sprawl. While this flaw has been long recognized in the literature (most notably by Wilbur Thompson (1968) in his article "The City as a Distorted Price System"), it has not been addressed as a critical path forward as it should be. Moreover, the mispricing under discussion here is created by government and their agencies—local, regional, provincial, and federal—which are often the very entities at the forefront of the sustainable community movement.

Places to Grow: The Growth Plan for the Greater Golden Horseshoe (Ontario 2006) is a regional plan for this growth and its supporting infrastructure. The Growth Plan is intended to optimize the use of existing and new infrastructure by promoting growth in a compact, efficient form. Figure 6.2 illustrates that compact urban form can save 20–60 percent on infrastructure costs (CEE et al. 1999; Blais 2010; Burchell et al. 2002; Duncan 1989). In addition, the Growth Plan intends that better use of land and infrastructure should be made by directing more growth to existing urban areas rather than suburban greenfield sites. Concentrating development in the urban areas also provides a focus for transit and infrastructure

Figure 6.1: Ontario's Greater Golden Horseshoe

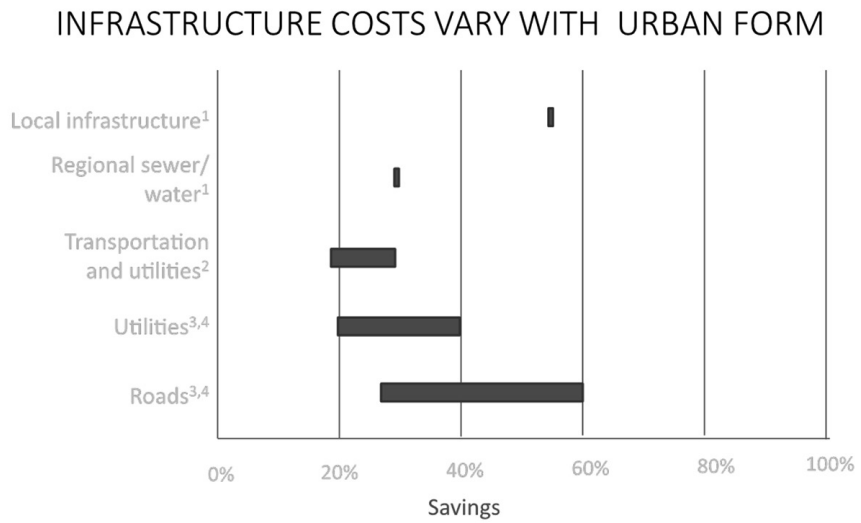


Source: Schedule 1 of the Growth Plan.

investments to attract further growth. The Growth Plan designates urban growth centres and establishes intensification targets, with minimum densities for these centres and for suburban greenfield development.

However, urban and regional planning is a slow process. Although Ontario's Growth Plan was adopted in 2006, its implementation requires that regional and local plans be amended to conform to the provincial plan. Few of the plans in the Greater Golden Horseshoe were in conformity in 2015, and most recent growth in population and dwelling units has been in greenfield areas, suggesting that the Growth Plan has had little direct impact in redirecting growth (Neptis 2015). This same pattern of strong suburban growth has been found in metropolitan areas across Canada (Gordon and Shirokoff 2014; Gordon and Janzen 2013).

Figure 6.2: Urban Form and Efficient Infrastructure



Source: Burchell, Lowenstein and Galley, 2002; Ottawa 2004; Speir and Stephenson, 2002; Chart from Metropole Consultants.

PRICES SHAPE URBAN FORM

Every day, Canadians make decisions about buying or renting a home and choosing premises for a business, institution, or government office. These decisions involve consideration of location within the city (centre, inner suburb, new suburb, exurb), the characteristics of the neighbourhood (walkable and mixed use or car-oriented), and the size of the building and lot. How to travel to and from the property (bike, walk, transit, car) is also an integral part of the decision. Though many factors may come into play, in the end these are fundamentally choices regarding land use and transportation. Ultimately, these decisions, multiplied thousands and thousands of times, significantly shape urban form and how our cities grow.

In making these land-use and transportation choices, the relative price of alternatives is a critical factor. In the case of residential construction as an example, this price includes not only that of the property and the house itself (purchase price, taxes, insurance, mortgage costs) but also consideration of ongoing costs such as property tax and transportation (vehicle costs, insurance, gas, parking, transit) and the cost of services such as electricity, natural gas, cable, or telephone. The problem arises because the property itself and these related services—let's call them collectively "urban goods and services"—are invariably mispriced in a way that encourages choices of sprawl and discourages choices of sustainable, efficient communities.

How does mispricing occur? It is well accepted that urban form factors such as density, location, land use patterns, and neighbourhood design affect costs of many kinds. These include the hard infrastructure costs of linear and network services like roads, transit, water, sewer, electricity, gas, or cable, and the costs of services like postal delivery, snow clearance, or garbage pickup.[1] But prices don't generally reflect these urban-form related cost variations. Take water rates as an example: charges for water are typically either a flat rate, or more recently, moving toward prices based on the amount of water used. Yet even usage-based prices do not reflect the fact that infrastructure costs are higher for more distant or less dense properties. It is estimated, for example, that a doubling of lot sizes increased water infrastructure costs by 30 percent (Speir and Stephenson 2002).

Where costs vary with urban form but prices don't, some customers will pay more than the costs they impose on the system, while others will pay less. As more efficient (e.g., denser, mixed-use, centrally located, transit-accessible) urban forms tend to be the lower cost-to-service ones, they also tend to be the ones that are systematically overcharged, while the less efficient urban forms or more distant developments pay less than the higher costs they incur. In short, where prices ignore form-related cost variations, distorting cross-subsidies occur.

DEVELOPMENT CHARGE DISTORTIONS

Figure 6.3, based on a study undertaken for the City of Ottawa, shows how city-wide development charges that disregard the cost effects of location can lead to invisible cross subsidies, based on a study undertaken for the City of Ottawa (Ottawa 2004). The bars show estimated development charges as they vary by location, while the solid line shows the level at which a city-wide charge would be set ($15,575). Had Ottawa adopted a citywide charge, it would have been overcharging development within the inner zone by about $5,000 per unit, and undercharging suburban development by amounts between $1,500 and $10,000 per unit. An average cost-based city-wide charge would have meant that the development in the inner zone was subsidizing suburban development by significant amounts. (Ultimately, the city adopted one charge for the inner zone and one for all suburban areas. However, most municipalities tend to use a city-wide approach.)

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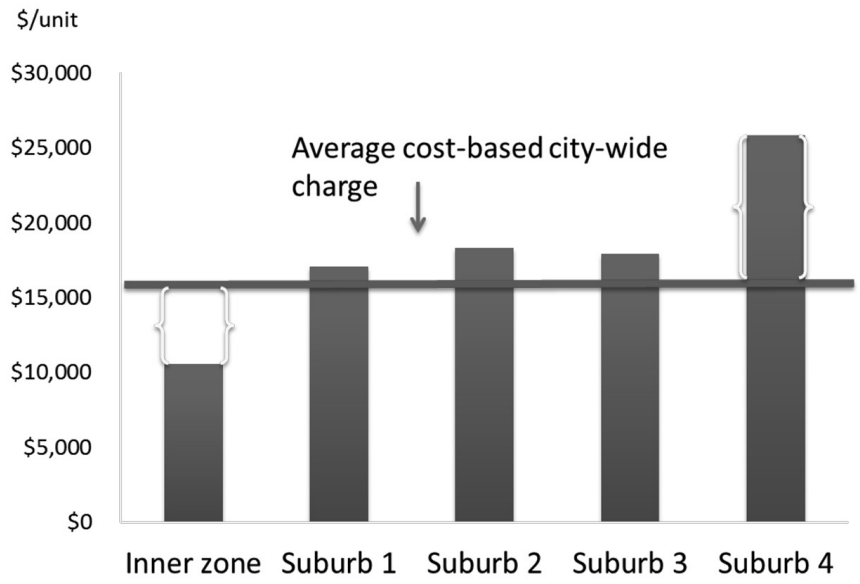
1. Mispricing is also the result of a failure to attach a price to the costs associated with sprawl of "externalities" such as air pollution, public health, congestion, greenhouse-gas emissions, and global warming. While this mispricing plays a role in creating sprawl, pricing of externalities is not the focus of this discussion. Here the focus is on the oft-overlooked mispricing of the already priced and market-traded goods and services that are part of market decisions that shape urban form.

Figure 6.3: Variation in Development Charges by Location



Sources: Ottawa 2004; Pamela Blais, 2011, "Urban Sprawl: The Price is Wrong," Plan Canada, 51 (2): Figure 1.

Development charges (DC) also tend to ignore the effects of density on infrastructure costs. Let's say there are two new homes of equal floor area on greenfield sites, one on a thirty-foot lot and one on a sixty-foot lot. Under a typical DC, both incur the same charge, say $25,000. Yet, given the extra metres of road, sidewalks, pipes, cables, and wires required, the actual costs associated with the wide lot are considerably higher than those for the narrow lot. The house on a small lot is overcharged: the actual servicing costs it incurs are $15,000. The house on the wide lot is undercharged; its actual servicing costs are $35,000. Nevertheless, both houses are charged $25,000 by the municipality to cover services, and this $25,000 must be recouped in the house price. The market price for the narrow-lot house will thus be higher than it would if more accurate pricing prevailed, and the market price for the wide-lot house will be lower than it really ought to be.

Under a more accurate pricing regime, the price differential between two homes would be greater, with a spread of $45,000 rather than one charge of $25,000 under an average cost-based DC shown in Table 6.1 below.

This example illustrates how a DC based on average costs brings the prices of the two types of house closer together than they would be if actual costs were used, thus distorting normal market signals (Blais 2010). Overcharging provides a disincentive to purchase the smaller, more efficient lot, and undercharging creates

Table 6.1: Average vs. Actual Cost for Development Charges (DC)

	Average Cost DC		Actual Cost DC	
	Narrow Lot	Wide Lot	Narrow Lot	Wide Lot
Lot and house	$100,000	$125,000	$100,000	$125,000
Development charges	$25,000	$25,000	$15,000	$35,000
Total price	$125,000	$150,000	$115,000	$160,000

Source: Blais, P. 2011. "Urban Sprawl: The Price is Wrong," Plan Canada, 51 (2): 18.

an incentive to purchase the larger lot, which under this regime of mispricing represents "great value" for the money.

These kinds of cross-subsidies invariably favour inefficient development at the expense of efficient development. As I show in my book *Perverse Cities*, the mispricing related to some common financial instruments uncovered instances of the following types of cross-subsidies:

- Those who live on small lots subsidize those living on large lots.
- Smaller residential units subsidize larger residential units.
- Those who don't drive or drive less subsidize those who drive most.
- Land uses that generate fewer trips subsidizes uses that generate more trips.
- Those who live in less expensive-to-service areas subsidize those who live in more expensive-to-service areas.
- Those who live nearer the centre of the city subsidize those who live further from the centre.
- Urban dwellers subsidize rural dwellers.

In other words, if land uses were cars, the Smart Car owner would subsidize the Hummer owner.

This variety of mispricing stems from the use of average costs as the basis for establishing prices for urban goods and services in which, in reality, costs vary with urban form. There are several other common sources of mispricing. For example, while clearly having significant costs attached to it, parking is often "free" to the user (Shoup 2005). In this case the issue is a complete lack of pricing. But what all varieties of mispricing have in common is that prices do not reflect actual costs, as those costs vary with location and urban form. The public sector plays a major role in the mispricing of urban goods and services integral to the property decision shaping urban form. How? The public sector sets prices for some urban goods and

services directly (e.g., water, development charges); it regulates prices for other services (e.g., telecommunications and electricity) and sets property taxes and other user fees. Local governments establish the prices for a substantial component of costs – for example, by setting development charges that become embedded in house and commercial property prices. Other tax policies and programs affecting the prices of urban goods and services include capital gains taxes, tax rebates on new housing, gas taxes, sales taxes, infrastructure grants, income taxes, and home-ownership programs. If mispricing was limited to one or two services, it might not play a large role in shaping urban form. As it is, mispricing is more the rule than the exception: it occurs across a wide range of urban goods and services, as well as a wide range of public sector financial instruments.

IMPLICATIONS OF MISPRICING

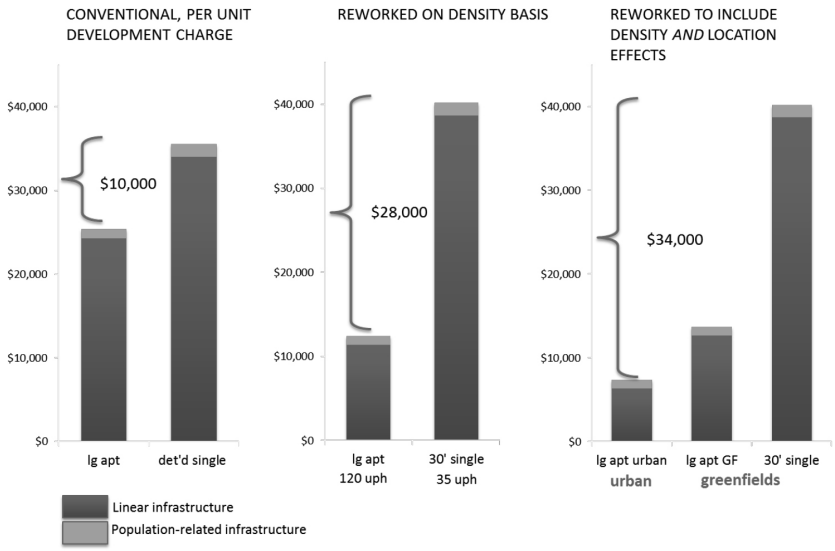
Urban infrastructure mispricing results in more sprawl and less efficient and sustainable urban development than would be the case if accurate pricing were in place. Mispricing results in overspending on building and infrastructure of all kinds and wastes resources. Money is misdirected to more metres of pipe or road rather than to more productive undertakings. Equity becomes a significant issue in the current environment, as those who choose to live more efficiently and sustainably subsidize the less efficient and less sustainable choices of others. This is particularly so given that the subsidies inherent in mispricing are largely internal, hidden and implicit and therefore not known or recognized by the "subsidizers." This lack of transparency makes truly informed decision making difficult if not impossible.

Mispricing works at cross-purposes to planning policies aimed at curbing sprawl by directly undermining them and rendering them less effective. A municipal planning department toils away developing plans and policy for sustainable communities, while down the hall the financial officials design development charges, user fees, or property taxes that effectively encourage sprawl. Delivering sustainable urban form therefore becomes more expensive than need be, as conflicting policies and programs often exist within the same organizations.

CURBING SPRAWL WITH BETTER PRICING

In short, if we truly want to promote efficient, sustainable communities, we need to tackle the causes directly, not just try to regulate the symptoms. That means identifying and correcting the instances of public sector mispricing that shape urban form in our community, and advocating strongly for the adoption of accurate pricing. The key is that price should reflect costs, *and those costs will vary with location, density, land use, and other factors*. If the costs of servicing new suburban

Figure 6.4: Reworking Development Charges to Include Density and Location Effects



Source: Blais, P. 2014. "What would happen if… development charges reflected how infrastructure costs vary with density?" http://metropoleconsultants.com/blog/

communities vary because of location within the community, the development charges should vary by location (Figure 6.3). If the costs of servicing vary because of density, the development charges should vary with density (Figure 6.4). The same principle applies to the price-setting of other financial instruments for urban goods and services. The real, direct costs associated with development choices must also be both transparent and apparent.

The implication of this analysis is not that we should simply flip the subsidies and subsidize efficient development, as is sometimes recommended. Though it may be warranted in certain circumstances, in the absence of accurate pricing this strategy simply represents a subsidy to counter the effects of an existing systemic subsidy. Rather, the aim is to create a level playing field of accurate pricing across all development types and locations. With recalibration, prices for the urban goods and services related to the less efficient development would typically increase, and for more efficient development they would typically decrease. This in and of itself would be a powerful force in curbing urban sprawl, without limiting choice or dictating densities. Those who favour low density or more distant locations would be free to chose them, but the prices they pay would now represent the actual costs associated with that development and would not be borne unknowingly by others.

Mispricing artificially inflates the demand for low-density sprawl, encourages overspending on municipal infrastructure, and artificially reduces the demand for more efficient development. This is not what a properly functioning market, one based on accurate price signals, would deliver. Some might doubt that an approach that relies more on the market could deliver a more sustainable, efficiently urban form. However, by definition, the job of the market is the efficient allocation of resources, and sprawl is in essence a gross misallocation of resources. But only a market that is functioning correctly—one based on accurate price signals and good information—will deliver these results.

It is therefore difficult to conceive of a convincing rationale for the status quo—a de facto policy of subsidizing sprawl and discouraging sustainable urban development. Instead, it is imperative that we understand these often complex and opaque forms of mispricing, as they play such key roles in driving urban development patterns. We must recognize not only how they operate in general but identify specifically how they operate within the context of local governments through what specific financial instruments or programs (including property taxes, user fees, development charges), and with what outcomes.

CONCLUSION

Mispricing can result in overspending on municipal infrastructure and/or the possibility of underperforming infrastructure investments, especially transit. We need to pay more attention to the effect of public sector "prices" on broader policy objectives. Better pricing can achieve some of these regional and rational planning objectives. To meet these policy objectives, we need to consider how infrastructure investments work together in actual urban environments and what other spending shifts may be needed.

For a more in-depth exploration of this theme, please refer to the author's 2010 book, Perverse Cities: Hidden Subsidies, Wonky Policy, and Urban Sprawl, *from UBC Press.*

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7

COST OVERRUNS ON INFRASTRUCTURE PROJECTS: PATTERNS, CAUSES, AND CURES

Matti Siemiatycki[1]

Municipalities across Ontario are in the midst of an infrastructure building boom. After decades of underinvestment, billions of dollars are now being spent to rehabilitate existing assets and construct new transportation, water, waste, public housing, civic, and recreation facilities.

The City of Toronto, for instance, plans to allocate $31.7 billion to social and physical infrastructure between 2015 and 2024. In York Region, the ten-year capital plan is forecast to be $6.6 billion; it is $2.4 billion in Mississauga, and $1.85 billion in Hamilton. Mid-sized cities also have significant multi-year capital plans, with infrastructure spending over the next decade budgeted at $1.75 billion in London and $438 million in Waterloo. These investments in the physical assets of cities are essential to the vitality of Ontario municipalities, as infrastructure provides the foundation upon which economic growth, environmental sustainability, and social equity and inclusion are achieved.

For the largest and highest-profile infrastructure projects, common challenges are construction cost overruns and schedule delays. "Spadina Subway Extension $400M over Budget" the *Toronto Star* stated in 2015.[2] "Mayor Apologizes for Cost

1. This chapter was first published by the Institute on Municipal Finance and Governance of the Monk School of Global Affairs, University of Toronto. We are grateful to Dr. Enid Slack, the institute director, for permission to reproduce it here. The material presented matches virtually precisely that covered by Dr. Siemiatycki in his earlier presentation at the State of the Federation conference.

2. T. Kalinowski, 2015, http://www.thestar.com/news/queenspark/2015/03/06/spadina-subway-xtension-400m-over-budget.html

Overruns in Construction of City Hall," reported the *Guelph Mercury* in 2014.[3] "City on hook for Union Station cost overruns" announced the *Toronto Sun* in 2015.[4]

Over the years, the media has tallied millions of dollars in rising costs and years in schedule delays on municipal infrastructure projects such as the construction of the Spadina Subway extension, the redevelopment of Union Station, the purchase of new TTC streetcars, the revitalization of Nathan Phillips Square, the upgrading of Queen's Quay Boulevard, the construction of Lansdowne Park Stadium in Ottawa, and the building of new city halls in Vaughan and Guelph. The media tend to report each one as an isolated case, with its own unique set of reasons that led to spiralling construction costs or lengthy schedule delays. Yet studies from around the world suggest that cost overruns and construction delays are an endemic feature of infrastructure project delivery, with a common set of causes and potential cures.

Poorly executed public works can burden governments with hundreds of millions of dollars in unexpected expenses, put the financial viability of projects at risk, and exacerbate construction-related disruptions for residents and businesses. Persistent project delivery problems also jeopardize public confidence in the ability of government to deliver complex but critically important infrastructure projects. As public trust is eroded, it can become harder to build support for the next generation of critical municipal infrastructure investments.

In this context, it is not surprising that municipal politicians such as Toronto mayor John Tory are "furious that this happens over and over again."[5] And city staff managing large public works projects are coming under increasing scrutiny when projects experience significant overruns and delays. Since 2012, two project managers have been fired at the Toronto Transit Commission and two more at the Niagara Falls Parks and Recreation Department in response to cost overruns on high-profile projects, raising the personal stakes of poor project management considerably.[6]

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3. J. Shuttleworth, 2014, http://www.guelphmercury.com/news-story/4631749-mayor-apologizes-for-cost-overruns-in-construction-of-city-hall/

4. D. Peat, 2015, http://www.torontosun.com/2015/03/02/city-on-hook-for-union-station-cost-overruns.

5. Mayor John Tory's displeasure with cost overruns on the Spadina subway extension was quoted in a *Toronto Star* article: B. Powell, 2015, "John Tory 'Furious' at Ballooning Costs of Spadina Subway Extension," http://www.thestar. com/news/queenspark/2015/03/06/kathleen-wynne-chides-ttc-for-cost-overruns-on-spadina-subway-extension.html

6. Details of staff firings in response to cost overruns are covered in "Two City Managers Lose Jobs over Gale Centre Cost Overrun," *Niagara This Week*, 2012, http:// www.niagarathisweek.com/news-story/3263524-two-city-managers-lose-jobs-over-gale-centre-cost-overrun/; "TTC Exec, Manager Fired over Massive Cost Overruns for Subway Extension,"CityNews,2015,http://www.citynews.ca/2015/03/19/ttc-exec-manager-fired-over-massive-cost-overruns-for-subway-extension/.

Local governments need to develop effective strategies to plan and deliver major infrastructure projects. This paper identifies approaches that municipalities can use to improve the accuracy and efficiency of their infrastructure project delivery. First, extensive international academic literature is reviewed to show how pervasive cost overruns and construction delays are on large infrastructure projects. Second, the causes of poor project delivery are identified. Third, strategies are proposed to minimize cost overruns and delays on large infrastructure projects.

HOW ACCURATE ARE COST ESTIMATES?

Procurement problems on large infrastructure projects are a global epidemic. They affect projects conducted by national, provincial, and local government and by private- sector organizations; they are a feature of a wide diversity of infrastructure project types; and they have been stubbornly persistent throughout history. Cost escalations and schedule slippage can occur during preliminary project planning as the initial concept is priced and the design refined; from the time that the project is approved until a final contract is signed; during the actual construction period until substantial completion is reached; and after completion, if deficiencies must be fixed.

The common definition of an overrun in most studies is a change in cost or schedule relative to the final estimate provided when the approval or "go decision" was made until construction is completed and the facility is operational. This definition means that a project is not necessarily considered on time and on budget just because it was built within the contracted price and schedule. Rather, a project is considered on time and on budget only if it is built to *the final estimate at the time when the project was approved*, which is typically before a construction contract is signed.

International research shows that most infrastructure megaprojects experience cost escalations, but the overruns depend on project type and size. In the transportation sector, Bent Flyvbjerg, Nils Bruzelius, and Werner Rothengatter conducted the largest and most robust study of cost overruns on a sample of 258 major roads, tunnels, bridges, urban transit, and interurban rail projects in twenty countries on five continents. Each megaproject cost $100 million or more, and most were the biggest, highest-profile, and most visible conducted in the jurisdiction at the time.

The study concluded that nine out of ten megaprojects experienced a cost overrun, and the average cost escalation was 28 percent. Rail projects in the sample experienced the largest cost escalations with the average overrun being 45 percent. Fixed-link bridges and tunnels on average had a cost overrun of 34 percent, and the average cost overrun on surface roads was 20 percent. This pattern of cost escalation was common across all countries in the study and was unchanged over the seventy years for which data was available (Flyvbjerg, Bruzelius, and Rothengatter 2003). The finding that transportation megaprojects routinely experience large

cost overruns is consistent with the results of the other studies of transportation megaprojects.[7]

Cost overruns are also a persistent problem on megaprojects in other sectors. Large information and technology projects that cost hundreds of millions or even billions of dollars, such as new enterprise software, management support systems, or digital customer record-keeping, are notorious for cost escalations. A 2011 study by Flyvbjerg and Alexander Budzier found that out of a sample of 1,471 IT megaprojects in the United States and Europe, the average cost overrun was 27 percent. And fully one in six IT projects had a cost overrun of 200 percent, which added hundreds of millions of dollars to the initial budget (Flyvbjerg and Budzier 2011). There was no difference in performance between Europe and the United States, or between projects undertaken by public- or private-sector organizations —they each experienced cost overruns equally. In Canada, the development of the PRESTO transit fare card by Metrolinx and of electronic health records by eHealth Ontario experienced significant cost escalations.

In the energy sector, a 2013 study by Flyvbjerg and Atif Ansar found that of 245 large hydro dam projects in sixty-five countries, the cost escalated on average by 90 percent between the final approved budget and the completed project. There was no improvement in budget accuracy over the seventy years of data that the study covered (Flyvbjerg and Ansar 2014).

In the case of major global sporting events, Flyvbjerg and Allison Stewart found in a 2012 report that for every Olympic Games between 1962 and 2012, final costs were higher than anticipated at the time that the bid was submitted. The average cost overrun in real terms was 179 percent for Olympic Games' host cities, higher than for other types of megaprojects (Flyvbjerg and Stewart 2012).

Studies of smaller, more routine construction and maintenance projects in the transportation sector show that cost estimates for this type of work tend to be more accurate. As three recent studies in the transportation sector found, only about half of all small road projects experienced a cost overrun, and the average escalation ranged from 4 percent to 9.5 percent.[8] A 2006 study of cost overruns on Canadian transportation projects conducted by Joseph Berechman and Qing Wu examined 163 routine highway, bridge, and tunnel projects on Vancouver Island and found that eight out of ten had cost overruns. The average cost overrun was 5.5 percent, while a considerable share of the projects had far larger cost escalations (Berechman and Wu 2006).

It appears that while overruns still occur, cost estimates tend to be more accurate for smaller, simpler projects that can be completed over a shorter period than for

7. For a detailed literature review of transportation mega project cost overruns, see Siemiatycki 2009.

8. For studies of routine transportation projects, see Ellis et al. 2007; Odeck 2004; Bordat et al. 2004.

megaprojects, and for projects that involve fewer subcontractors. These routine projects are also less likely to get caught up in politicized decision-making processes that can surround a high-profile megaproject.

WHY DO COST OVERRUNS PERSIST?

Explanations for cost overruns can be grouped in three categories: technical challenges, over-optimism, and strategic misrepresentations.

Technical Challenges

Technical challenges with project management and delivery take a variety of forms:

- *Scope changes and change orders*. The specifications of the project are changed following the "go decision," leading to escalating costs. Scope changes include major alterations to a facility, such as the addition of new stations on a transit line, the inclusion of additional tunnels where a road was planned on the surface, or additional space in a building. Politicians often initiate these significant changes to ensure that their constituents benefit from a project or that the harm to adjacent communities is mitigated. Change orders may take the form of contractor-initiated variations to the approved facility design to correct errors and make the facility buildable, or minor variations to change finishing materials or facility layouts to meet the evolving desires of the client. On large, complex infrastructure projects, hundreds of change-order requests may be instigated by the various stakeholders, all of which have to be negotiated and approved between the client and the contractor. This can be a time-consuming, costly, and sometimes contentious process.
- *Hand-over problems*. Large construction projects involve cooperation between the government client and a general contractor, and between the general construction contractor and multiple subcontractors. Disputes between these parties about the work quality of other partners and responsibility for errors made on a project can lead to schedule delays and rising project costs.
- *Incomplete studies prior to project approval*. Project approval and construction on large infrastructure projects often proceed before all technical feasibility and engineering studies are completed, leading to escalating costs as more details about the project are confirmed. This problem occurs because governments often expedite approvals to get urgent projects started quickly or to make project announcements to meet program funding deadlines or election timelines.

- *Inflation in labour and material costs*. Infrastructure projects often rely on key construction materials and workers in specialized building trades, the cost of which can escalate over the course of the project. This tends to occur when projects are built during periods of strong economic growth and tight employment markets, which creates scarcity and drives price increases.
- *Inaccurate forecasting*. Since large infrastructure projects are complex and take place in a context of uncertainty, accurately forecasting final project costs can be difficult. Forecasting problems include the use of inappropriate methods or inaccurate underlying assumptions attributable to poor quality or incomplete data, and unforeseen, dramatic shifts in external conditions.
- *Project delays*. Strikes, challenges in sourcing materials or skilled workers, or disputes among different contractors on a job can upset a tight project delivery schedule. Utility companies' requirements to relocate sewer, water, electric, or telecommunications infrastructure is another common cause of delays; meanwhile, the builder often must pay work crews and sub-trades for additional time.
- *Unforeseen events*. A very cold winter or unusually heavy rains can delay a project and increase costs. Construction accidents also lead to delays and additional costs. And uncovering unexpected pollutants or asbestos, undocumented utilities, or archaeological artifacts on a worksite may lead to further work and higher costs.
- *Poor project reporting and performance monitoring*. Governments may not have the decision-support systems in place to track contractor performance as the job progresses or to select contractors who have a strong record of delivering quality projects on budget and on schedule.

It is perhaps to be expected that technical reasons for cost overruns are most often cited by stakeholders involved in the delivery of a project, as this explanation minimizes their level of responsibility for the problem. However, technical problems with project delivery are not the sole explanation for the persistence of cost overruns, for two key reasons.

First, if cost overruns on megaprojects were truly unexpected, over a large sample of projects they would follow a normal distribution: half the projects would experience cost overruns and half would be completed under budget. But this is not the case. Evidence suggests that the distribution is highly skewed and the costs of infrastructure megaprojects are systematically underestimated.

Second, government-led infrastructure projects are delivered by professional project managers who can learn from past experience. If cost overruns were merely caused by technical problems with project delivery, then the size and frequency of cost overruns would decline over time as forecasting and project delivery methods improved. However, data from thousands of projects show that cost overruns are

a consistent feature of large infrastructure project delivery, suggesting that other factors are at play.

Bent Flyvbjerg, professor of business at Oxford University and the leading expert on megaproject management, provocatively argues that the real causes of cost overruns can be categorized into two groups: "fools" and "liars": "Fools are the reckless optimists who see the future with rose-tinted glasses. These forecasting fools ignore hard facts and uncertainty, betting the family silver on gambles with a very low probability of success. Liars deliberately mislead the public for private gain, fiscal or political, by painting overly positive prospects of an investment, just to get it going."[9]

OPTIMISM BIASES

For decades, researchers studying human behaviour have found that people are prone to "planning fallacies" or optimism biases whereby they underestimate the time and cost to complete a task. As Daniel Lovallo and Nobel-prize-winning economist Daniel Khaneman explain, "Most people are highly optimistic most of the time" (2003). Research shows that people tend to display overconfidence in their own abilities, talents, and skills. They are quick to take personal credit for positive outcomes, while attributing failures to unexpected external events like inflation or poor weather. They typically exaggerate the degree of control they exercise over the unfolding of events, and they often downplay the role of luck or chance in achieving a successful outcome.

The tendency of individuals to accentuate the positive is amplified by forces within organizations. Most organizations have limited resources to pursue new initiatives, and there is often strong internal competition amongst various options. This creates a powerful incentive for individuals drafting new plans and proposals to emphasize the positives to give their preferred project the best chance of being implemented. Early forecasts and project plans then tend to become anchors around which future technical and cost estimates are made, magnifying bouts of over-optimism. These tendencies are compounded in situations in which the results of a plan will not be known for many years, staff turnover is quick, and there are few personal consequences for underestimating project costs. Faced with the prospect of making an optimistic forecast in the short-term to get a project started or an accurate long-term forecast, the favourable short-term forecast usually prevails.

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9. Flyvbjerg gave this quote in a press release to explain the findings of a paper on cost overruns that he wrote in 2014, http://www.sbs.ox.ac.uk/school/news/press-office/press-releases/ large-hydro-electric-dams-unviable-and-seriously-damaging- emerging-economies.

Taken together, the innate human condition of being over-optimistic about the outcome of future events, combined with subtle organizational pressures to accentuate the positive, leads to forecasts in which costs are chronically underestimated. However, as Flyvbjerg argues, a more cynical explanation for cost overruns points to willful misrepresentation on the part of project planners and promoters.

Strategic Misrepresentation

Infrastructure projects create winners who stand to gain financially or in terms of prestige from the delivery of a large public works project. These include politicians, bureaucrats, consultants, lawyers, construction contractors, property owners, and community residents, depending on the project. But there are few direct consequences for these participants when budget expectations are not met.

When project construction is entirely financed by government, the costs of overruns and schedule delays deemed the responsibility of government are borne by taxpayers rather than those who planned, approved, and promoted the project. Until recently, few government employees were ever fired over projects that experienced cost overruns.

This means strong incentives for proponents to strategically misrepresent initial budgets to get a project approved, funded, and started, knowing that once work begins, few projects are ever halted. Studies by Don Pickrell (1992) and Alan Altshuler and David Luberoff (2003) have found that municipal government officials applying for senior-level government funding have an incentive to underestimate the costs of their pet projects to make them more attractive to provincial or federal governments. Politicians and project promoters have an incentive to underestimate the costs of their preferred infrastructure plans to make them palatable to voters. And contractors competitively bidding for projects may strategically underestimate costs, knowing that once they win the job, they can drive up the price through change orders.

Scholarly articles with titles such as "When Planners Lie with Numbers" (Wachs 1989), "The Lying Game" (Flyvbjerg 2003), and "Deception in Dallas: Strategic Misrepresentation in Rail Transit Promotion and Evaluation" (Kain 1990) have documented how cost escalations result from a systemic pattern of wilful misinformation on the part of project proponents seeking to maximize their individual benefits from an investment initiative. As Bent Flyvbjerg writes, the projects that get built are not "necessarily the best ones, but those projects for which proponents best succeed in conjuring a fantasy world of underestimated costs, overestimated revenues, undervalued environmental impacts, and overvalued regional development benefits" (2005).

CURES FOR COST OVERRUNS

As has been demonstrated, cost overruns on large-scale infrastructure projects are a persistent problem with a diversity of complex technical, psychological, and political economic causes. In response, measures are required that together address the varied causes of escalating project costs: strategies to improve the technical management and oversight of megaproject procurement; innovative cost estimation techniques to mitigate the effects of genuine optimism biases; and new project delivery approaches that create incentive structures that reward accurate forecasting and construction management while delegitimizing the strategic misrepresentations that are sometimes used to get projects started. Below are five promising approaches, drawn from international best practices, to reduce construction cost overruns.

1. Enhance Performance Monitoring, Reporting, and Information Sharing

The world is experiencing a big data and analytics revolution. From professional sports to product marketing, sophisticated new methods are being developed to improve performance by collecting and statistically analyzing massive amounts of data. Yet infrastructure megaproject delivery remains a sector that has been largely untouched by this trend.[10] International research on infrastructure project cost overruns has identified a lack of systematic tracking across government departments of how project cost and schedule estimates at the time of project approval compare with the outcome.[11] As a result, limited institutional learning from past experience is taking place and information is not being harnessed in real time to improve decision making.

Cities should therefore require that data on procurement performance be collected for all infrastructure projects over a minimum cost threshold. Data collection should be coordinated through a central department and conducted through a single software application. Project managers in departments (and agencies) across the city should be required to input the schedule and cost details of each project into the software program when it is initially approved, at the time the contract is

10. Many Ontario municipalities do compile and publish a record of all firms awarded contracts over a minimum threshold and the contract price, on a website known as a "call document system." But these call document websites are primarily designed to promote disclosure and fairness in contract awards rather than cost containment, and most do not publish data on the estimated project budget when the project was approved or the total final price paid for the contract.

11. For further details on the record of performance tracking on infrastructure projects, see Siemiatycki (2009).

signed, and at substantial completion. Other data about each project would also be collected: the type, size, and location of the project; the firms and project managers involved; the project delivery model (i.e., traditional procurement, public-private partnership, joint venture, etc.); major changes to scope; the causes of any cost escalations or schedule delays; measures of construction quality and safety on the job site; and any long-term construction defects.

Such evaluation systems are by no means a novel concept in Ontario municipalities, especially as they pertain to measuring vendor performance. Many municipalities include formal contractor performance evaluations as part of their tendering policies. In 2013, for instance, the City of Toronto mandated that the general contractor on any city construction job be evaluated using a common Contractor Performance Evaluation Form.[12] Here, the focus of the evaluation is expanded to include a broader range of factors. Inputting data as the project is ongoing would reduce the costs associated with retrieving this information after the fact, and make it possible to account for changes in budgets over time that can make it difficult to accurately interpret a project's success.

Over time, this performance tracking system would develop a very large dataset that could be statistically analyzed to show trends in the dynamics of infrastructure delivery costs, quality, and cost overruns. Analysis would show whether certain types of projects are more prone to overruns, how firms and departments compare in terms of cost containment, and how the cost of building different types of facilities are evolving Cities could then develop predictive models that estimate the likelihood of cost escalations under various conditions. The system could also identify the early warning signs of any strategic or corrupt project pricing behaviour, if project costs vary widely from the observed norm for that type of infrastructure.

2. Reward Good Performance

Long-term, sustained improvements in performance are greatest when incentives reward individuals or firms that rank at the top of their league while penalizing those that fail to meet performance expectations.

One approach that has gained international interest is the implementation of formal prequalification systems, which give firms with a good track record an improved chance of obtaining future contracts. Although such systems have been used to drive up the quality of infrastructure procurement, in Canada they are commonly designed so that if a firm meets the minimum standard required, it is eligible to bid for a government construction job.

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12. For more information on the City of Toronto's Contractor Performance Monitoring Form, see http://www1.toronto.ca/wps/ portal/contentonly?vgnextoid=02cca8ce4a131410 VgnVCM100000 71d60f89RCRD

In Hong Kong and Singapore, by comparison, firms found to be consistently high-performing in terms of quality construction and budget certainty on previous jobs are assigned extra points when their bids are evaluated. Such high-performing firms may thus beat out low-performing firms even if their bids are scored slightly lower or cost a little more. Such prequalification systems give all firms an incentive to deliver projects on time and on budget and meet their quality targets on each job.[13]

The ranking of each firm is based on results from numerous previous projects, since cost overruns on any single project can be caused by factors that may or may not be within the control of the contractor. The strength and legitimacy of the prequalification system is predicated on the development of a data collection regime that is rigorous in capturing both the size and causes of cost overruns as well as construction quality.

3. Enhance the Management Capabilities of Staff

Weak project management by city staff has been identified as a common source of cost overruns. There is a growing need for city government staff with specialized skills to manage the complex relationship between the public and private sectors.

Necessary skills for the contemporary government project manager include the ability to write effective requests for proposals that clearly articulate the client's demands; to manage competitive tender processes designed to select firms based on best value rather than lowest bid; to draft enforceable contracts that clearly transfer the risk if budget expectations are not met or if change orders are requested by the contractor; to oversee change orders initiated by government; and to use conflict resolution approaches when tensions between partners arise. In addition, sufficient resources must be available to support the function of contract drafting, management, and monitoring, such as effective training programs.

In the United Kingdom, for instance, Cabinet Office of the national government responded to a history of weak government megaproject procurements by creating the Major Projects Leadership Academy. The Saïd Business School at Oxford University and Deloitte consultancy provide the training, and the program offers instruction on best practices for effective project delivery. Senior government staff members in departments that oversee major infrastructure projects in the United Kingdom are required to have completed the program.[14]

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13. For further information on the bidder prequalification and tendering systems used in Singapore and Denmark, see Siemiatycki (2008).

14. For more details on the UK Major Project Leadership Academy, see https://www.gov.uk/government/news/major-projects-leadership-academy-celebrates-first-set-of-graduates.

4. Apply State-of-the-Art Forecasting Techniques

Numerous innovative techniques have been designed to deliver more accurate *ex-ante* project-cost estimates. Benchmarking a project under review against a representative reference class of recently completed projects has been proposed to assess probable project costs and overrun magnitude more realistically than developing forecasts based on internal agency predictions of costs (see Lovallo and Khaneman 2003; Flyvbjerg 2003).

In line with such an approach, the British government has provided guidance on applying "optimism uplifts" to transportation project cost estimates, which are based on empirical measures of cost overruns on past projects in the sector (British Department for Transport 2004). This method of reference class forecasting is enabled by data collected through the implementation of a rigorous performance monitoring system. In a 2015 study, James Odeck and his colleagues found that cost overruns were reduced on large transportation projects in Norway by instituting a quality assurance program whereby initial cost estimates were reviewed by external advisors before final approval was granted (Odeck, Welde, and Volden 2015).

While few oppose the application of state-of-the-art forecasting and risk assessment techniques, their application is constrained by limitations on budgets, time, and staff expertise. One way to lessen the burden of applying such techniques is to standardize parts of the process. For instance, enhanced data collection on cost overruns can be used to develop dynamic registries of reference classes and project benchmarks as comparators in the assessment of future projects. And a common set of instructions, procedures, and assumptions for estimating the costs of different types of projects can be developed, as in Britain, so that all proposals are subjected to a similar analysis and thus more easily audited for accuracy.

5. Make Selective Use of Public-Private Partnerships

Public-private partnerships (PPPs, or P3s) have become increasingly popular in Canada as a procurement model. To date, provincial governments have been the primary users of P3s. P3s have two main features designed to incentivize on-time and on-budget project delivery. First, they bundle multiple aspects of project delivery, such as facility design, construction, operations, and maintenance into a single contract. This creates a level of integration within the consortium of designers, builders, and operators of the facility right from the planning stages of the project. There is a direct line of responsibility within the consortium for any design flaws or challenges during handovers between subcontractors on the job.

Second, P3s function as pay-for-performance contracts in which the private-sector concessionaire finances all or a portion of the initial construction costs of the project. The private-sector partner is repaid its initial investment in the project by government or through user fees over the entire life of a long-term operating

concession that can last between twenty-five and fifty years, provided service quality standards in the contract are met.

Having a significant amount of private capital at stake during the construction of a project provides an incentive for the contractor to meet performance objectives and gives greater leverage to the government client to enforce the terms of the contract. Recent provincial government P3s in Ontario have delivered a high level of cost certainty. A study commissioned by Infrastructure Ontario found that of thirty projects delivered since 2007 by the provincial government agency, twenty-nine were completed below budget and twenty-two were completed on time (MNP LLP 2013).

Yet the value and suitability of P3s for municipalities has limitations, and this model of procurement should be applied with care. Due to the high costs of structuring and executing a P3 deal, P3s make sense only for projects with a capital value of at least $50 million, thus excluding many smaller municipal projects. Many municipal infrastructure projects are also closely integrated within an existing network of service and thus there is no effective means of introducing private operations—for instance, on one portion of an extended rapid transit line. Additionally, although P3s may provide cost certainty to government, private financing of infrastructure over a long-term concession period comes at significantly higher cost than direct public borrowing. The private consortium also charges a premium to assume the risk of cost overruns. Together, these costs can add 10 to 20 percent to the upfront price of delivering a comparable infrastructure project through a traditional government procurement model (Siemiatycki and Farooqi 2012).

In practice, P3s are like purchasing an insurance policy against the likelihood of a cost overrun. The government pays a significant premium up front to ensure cost certainty and protect against a far larger cost exposure if the budget increases as the project progresses. Purchasing this type of insurance through a P3 delivers value only for the largest, most complex, and riskiest municipal infrastructure projects, for which major cost overruns are a likely occurrence. The implementation of performance monitoring systems that systematically track patterns of cost overruns across a large number of municipal projects would provide empirical evidence to identify projects that are appropriate candidates for P3s.

While P3s are suitable only for certain large municipal public works projects, the lessons learned from this approach can be applied to local infrastructure projects. In particular, bundling facility design and construction into a single contract can be used on smaller infrastructure projects to create synergies and accountabilities between the designer and builder. As studies by Jan Whittington (2012) and Ralph Ellis and his colleagues (2007) conclude, design-build contracts can lower the size of cost overruns on routine infrastructure projects by minimizing the number of change orders and claims against the government client (Whittington 2012). Also, including some short-term, private construction financing in traditional procurement contracts to be repaid by government once construction is substantially complete can

incentivize contractors to meet their performance expectations, without incurring the full cost of long-term, private financing as is typical in P3s.

CONCLUSION

Cost overruns have plagued government infrastructure projects for decades. As demonstrated above, if rising construction costs were merely the result of technical challenges associated with delivering large, complex projects, then it is likely that the problem would have been solved by now. In practice, there are deep psychological and political economic factors that also contribute to the persistence of this phenomenon.

However, a suite of policy prescriptions can together minimize cost overruns by shifting the incentive structures of project delivery in three important ways. First, the power of big data can be applied to make the patterns, triggers, and culprits of project overruns more transparent and thus enable learning from experience. Second, contracts and procurement models can be designed to motivate all stakeholders to deliver on their obligations or face appropriate consequences. Alternative project delivery arrangements that bundle facility design, construction, and short-term project finance are appropriate to incentivize successful delivery of select projects. P3 concessions that involve long-term private finance, facility operations, and maintenance have the potential to significantly impact the cost and effective provision of municipal services, and require careful study to ensure that public value is realized. Third, regardless of the procurement model used, the delivery of public works projects must be carried out by skilled procurement-management personnel who apply the most advanced cost forecasting methods, have the expertise to negotiate fair contracts, and are appropriately empowered to enforce the terms of the agreement.

The outstanding question arising from this analysis is whether any of the main stakeholders involved in municipal infrastructure delivery—politicians, city staff, and firms—have an interest in moving beyond tough talk about cost overruns to implement strategies that actually address this problem. Historically, the answer to this question has been no. None of the stakeholders involved in delivering municipal infrastructure projects has been willing to upset the status quo and implement a comprehensive program aimed at reducing cost overruns in public procurement. On the contrary, all parties prefer to obscure the frequency and magnitude of cost overruns, avoid identifying which city departments and firms perform worse than others, and evade accountability for project failures. Moreover, expanding data collection, providing staff training, and improving forecasting methods are costly—a deterrent to action during periods of tight municipal budgets.

However, the costs to governments of unexpected overruns are staggeringly large, easily costing tens if not hundreds of millions of dollars a year, thus justifying, in

purely economic terms, the expense of remedial measures. More broadly, political economic incentives may be shifting towards the implementation of more effective strategies to clamp down on the causes of cost overruns. With intense media scrutiny of each high-profile failure, politicians are becoming increasingly sensitive to the problem. City staff may be more receptive to implementing strategies to stop cost overruns if, justified by the facts of the case or not, there is a growing trend of municipal project managers bearing the ultimate responsibility and losing their jobs due to poorly executed infrastructure projects. And as politicians and city staff become more motivated to eliminate cost overruns, firms that have a good track record may recognize a commercial benefit in being identified for delivering projects on time and on budget and therefore support policies that reward high-performing companies.

Effective strategies do exist and are being implemented elsewhere to measure and incentivize effective management of large public infrastructure projects. Is there a will to implement these strategies at the municipal level in Ontario?

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8

INFRASTRUCTURE AND INTERGOVERNMENTAL RELATIONS: A POLICY FRAMEWORK, ROLES, AND RELATIONSHIPS, AND A CASE STUDY

André Juneau

This chapter explores the relationship between infrastructure policy and Canadian federalism.

The first part proposes a framework to guide infrastructure policy. The second part discusses the intergovernmental features of the framework. The third part moves to a case study based on the first four years of the federal government department known from 2002 to 2004 as Infrastructure Canada and since then as Infrastructure and Communities. The reader should keep in mind that the author served as the first federal deputy minister of infrastructure, from 2002 to 2006.

A FRAMEWORK FOR INFRASTRUCTURE POLICY

It is useful to base an infrastructure policy on four broad principles:

1. Projects should be related to policy purposes and priorities should be set among the projects.
2. A broad range of actors should be involved in making decisions about priorities, purposes, and projects.
3. A complete set of funding mechanisms should be available.
4. Execution and monitoring should be effective, transparent, and undertaken by the appropriate actors.

INFRASTRUCTURE PROGRAMS SHOULD HAVE PURPOSES AND PRIORITIES

There are clearly more desirable infrastructure projects than governments could possibly design, fund, and execute, with or without the private sector. Hence the obvious need to set priorities. But before choices can be made among projects, there is a need to specify purposes. Infrastructure programs and projects should support reasonably specific public policy purposes, such as improving international or internal trade, reducing greenhouse gases, facilitating smart urban growth, improving access to jobs, and improving access to natural resources. The original categories for eligible projects under the 2002 Canadian Strategic Infrastructure Fund (listed later in the chapter), for example, were not well connected to public policy purposes and did not display a sense of federal jurisdiction.

The main reason to insist on priorities is that much of the public discussion on the need for infrastructure is devoid of them. Too often, infrastructure deficit numbers appear to be aggregations of the needs (not to say wish lists) of various sectors, without a sense of either priorities (i.e., should all roads in need of repair be repaired right away?) or without trade-offs (i.e., more and better urban roads, or better public transit?). On the other hand, the Canadian Infrastructure Report Card discussed elsewhere in this book reviews carefully the needs in various sectors but does not add up the findings across sectors.

Clarity of purpose and an insistence on priorities will contribute, where there is a will, to more productive intergovernmental relations. Projects with a purpose will be more easily related to the appropriate jurisdiction. Thus, a provincial highway as such would probably not qualify, but one that clearly contributed to improving interprovincial or international trade would.

THE FULL RANGE OF INTERESTED AND AFFECTED ACTORS SHOULD BE INVOLVED

Subject to the roles of other governments and to stakeholders, elected officials, advised by non-partisan officials, should make infrastructure decisions. There are risks, but in this sector as in other sectors of government activity, decisions, particularly the trade-offs between different priorities or regions and the integration into government agendas, can and should be made by ministers. This does not mean that there is no room for outside or independent advice, or for non-government financing and execution.

Aside from intergovernmental cooperation (to be reviewed later), what other actors should be involved? Easily forgotten are the communities affected by projects. Communities can be represented by the municipalities or by Aboriginal governments. Other forms of community involvement will also often be necessary. One

would think that after decades of concerns and objections, sometimes successful, governments would have learned to deal effectively with community views of infrastructure projects, especially large ones.

There are also stakeholders with an interest in, and often knowledge about, infrastructure needs. The more obvious groups are the Federation of Canadian Municipalities and the many provincial associations of urban and rural municipalities, the many civil engineering groups, the transportation associations, and so on. There are also groups that do not normally interact with the federal government in particular but who bring a lot to the table—as an example, the Cement Association of Canada. The provincial representation on its board of directors is often made up of senior representatives of international corporations who can discuss both provincial and international issues. This is a neglected factor in the understanding of Canadian federalism. Another set of actors arises with cross-border projects. The most striking example to date has been the Windsor-Detroit crossing, which involved the two federal governments, the governments of one province and one state, and at least two cities, Windsor and Detroit, and private-sector actors.

Regional ministers are also important actors in infrastructure decisions and are ignored at some peril. They usually are the senior minister in a province who is expected to provide a regionally sensitive political judgment on a range of federal activities. This group represent "an unheralded aspect of Canadian politics," as Herman Bakvis has pointed out in his remarkable book on these actors (Bakvis 1991). He might have added that they also are an unheralded aspect of Canadian federalism. As he discusses in his closing chapter, in the federal Cabinet, regional ministers have played two somewhat distinct roles, at least for our purposes here. Internally they have been active in the discussions over projects in their region, both in the choice of projects and in the level of available funding. This activity took place before and during the discussions with provincial authorities. Externally, regional ministers have played a role that could be useful to the infrastructure minister and his department through quiet political contacts with their provincial interlocutors on specific projects, either at the decision or implementation stage.

A COMPLETE RANGE OF FINANCING TOOLS SHOULD BE AVAILABLE

The challenge here can be to focus too much on financing and not enough on purposes. This out-of-sequence focus is often found in discussions with private-sector actors such as pension funds. Answering the question about sources of financing is of course necessary, but the answer is only helpful once purposes and priorities have been identified.

Current expenditures, borrowing, loan guarantees, intergovernmental cost-sharing or transfers, and public-private partnerships (P3s) are the main financing

techniques. Each has its own challenges and characteristics. Funding projects designed to last decades out of current expenditures seems unnecessarily cautious and limits the legitimate ambitions of infrastructure policies. Having said that, municipalities face borrowing constraints not faced by other governments.

The field of P3s in Canada has considerably matured over the past decade or so, and many governments, federal and provincial, have created agencies dedicated to infrastructure P3s. Designing, financing, and operating a project through a P3 involving two or three governments and private-sector consortiums could add to the degree of complexity, especially when all governments were still learning about the unusual arrangements of P3s, such as the need to provide for penalties in the event that a partner drops out on non-substantive grounds.

PROJECTS SHOULD BE DELIVERED BY THE APPROPRIATE GOVERNMENT IN A TRANSPARENT AND EFFECTIVE MANNER

First, an institutional structure needs to be adopted. The previous section on who decides noted the value of decisions being made by elected officials, namely ministers, mayors, municipal councils. In the case of ministers, should they be sectoral ministers (for example, ministers responsible for transportation, for drinking and waste water, for urban development)?

Or should they be infrastructure ministers? The former will have on staff specialists such as civil engineers. They will have experience with building projects, with some aspects of financing issues. But they tend to not have or accumulate broad intergovernmental experience. They are not inclined to develop community-relations experts. They do not develop experience in one sector that would be helpful in another. More importantly, they do not have a mandate to think in terms in trade-offs. For instance, with a finite amount of money, should a federal agreement with a provincial government fund only highways, or "fewer" highways and a wastewater plant? Having said all that, cooperation between sectoral and infrastructure departments is essential.

The other significant issue with programs segmented or managed by line departments is that it becomes very difficult to avoid universal highway programs, universal convention-centre programs, and so on. Global, multi-purposes programs will facilitate trade-offs within governments and among governments. The processes this requires are better managed by dedicated infrastructure ministers and ministries.

Infrastructure departments are thus a good idea, but there is great variety across provincial and territorial governments in how they deal with this area. There is in fact no mapping of structures across the country. This would be useful. The absence of a similarity of institutions here makes multilateral collaboration more challenging. Some provinces have dedicated infrastructure departments; some

combine infrastructure with transport; some do not have a bureaucratic component anywhere. Many municipal governments, on the other hand, have long had an identifiable capital-planning function although of course they vary greatly in the integration of capital planning and overall policy.

INTERGOVERNMENTAL RELATIONS AND THE FRAMEWORK

This section delves more specifically into the intergovernmental dimensions of the framework proposed above. The starting point is that jurisdictions inevitably overlap (or, as the phrase goes, there are basically no watertight compartments), and cooperation and cooperation mechanisms are indispensable. Vernon Bogdanor says it well: "Indeed, in the modern world, it is hardly possible in any democracy to maintain a rigid line of demarcation between different levels of government" (1999).

Another question cuts across the four principles: who has jurisdiction over infrastructure? Much of the public discussion seems to be based on the idea that jurisdiction does not matter in this field. This assumption is apparent when provinces, territories, and municipalities demand federal funding, or when the federal government allocates funds to infrastructure and sometimes feels empowered to decide on their use. It is then useful to keep in mind that governments have the responsibility for infrastructure in the areas under their jurisdiction. That still requires cooperation. Above all, this is a sector where what the Germans call "federal loyalty" is essential (Burgess 2012).

PURPOSES AND PRIORITIES

What constitutes infrastructure can be defined in various ways. For purposes of this chapter, it is convenient to start with the list in Section 2 of the bill following the budget tabled in December 2001 that launched the Canadian Strategic Infrastructure Fund:

> Strategic infrastructure means any of the following fixed capital assets that are used or operated for the benefit of the public:
>
> (a) Highway or rail infrastructure;
>
> (b) Local transportation infrastructure;
>
> (c) Tourism or urban development infrastructure;
>
> (d) Sewage treatment infrastructure;
>
> (e) Water infrastructure; or
>
> (f) Infrastructure prescribed by legislation. (Government of Canada 2002)

It is immediately apparent that not all the above categories are squarely within federal jurisdiction. In fact, only part of (a) and, potentially, elements of (f) are. How, nevertheless, a federal program was launched and managed on the basis of this legislation is the subject of the case study in the next section. The budget also included a Border Infrastructure Fund (BIF).

An effort to identify infrastructure purposes that would be under federal jurisdiction (setting aside federal government assets) or consistent with legitimate federal interests would include, for example, supporting interprovincial and international trade, regenerating harbour fronts (because of the extensive federal properties), reducing greenhouse gases, and improving access to natural resources. The Vancouver gateway is a good example. Facilitating trade with the Pacific region is an important federal goal, and it requires investment in projects under federal, provincial, and municipal jurisdiction.

The implication of the above is that, in principle, the Government of Canada should not be investing in local transportation and water infrastructure, for instance, where there is no apparent federal jurisdiction (except on First Nations reserves). At least two counter-arguments can be raised. First, such projects can contribute to the reduction of greenhouse gases. Second, the federal government has a legitimate interest in the health of large Canadian cities. Both arguments would justify investments in large urban transit projects, for instance.

Finally, some would argue that reducing the existence of a fiscal imbalance between the federal and provincial fiscal capacities is a valid purpose of federal infrastructure spending. On the other hand, perhaps this argument is best dealt with in the context of the fiscal arrangements and equalization.

WHO SHOULD DECIDE?

There are not many situations involving important federal infrastructure projects where the federal government should decide alone. Even the location of a federal building, built with federal funds, would normally benefit from, if not require, provincial and municipal views. At one time, the then federal Department of Public Works intended to be explicitly guided by a good-neighbour policy, inspired apparently by its US counterpart (Ircha and Young 2014). Then there are projects within federal jurisdiction, such as improvements to the Trans-Canada Highway in the Banff National Park, that require coordination with provinces.

At least one sector is generally not subject to overlapping intergovernmental responsibilities: the rail sector. When consulted on priorities, provinces almost never mention rail lines, railway crossings, and such matters, which are considered, correctly, as coming under federal jurisdiction. But when looking at the priority needs of the Canadian transportation system from a national or regional point of view, one would think that rail projects would come to mind. However, provinces

tend not to identify rail projects as priorities for fear that spending in this area would take way from their own usual priorities.

The need for provincial involvement in federal infrastructure decision making has already been noted. On the other hand, it is not consistent with cooperative federalism for provinces and territories to ask for a simple financial transfer, with decisions about infrastructure purposes and priorities to be left solely to them.

The federal interest in the health of large urban areas needs to be examined carefully lest it become a pretext for federal meddling. The issue would require a carefully thought-out rationale based on the outcome of discussions with, and at the request of, the relevant provincial or territorial government as well as the affected municipalities. Many desirable initiatives would benefit from such cooperation. An example is the work on the federally owned Autoroute Bonaventure in Montreal.

First Nations and Inuit governments are clearly affected by federal and provincial infrastructure programs and projects. Governments at all levels are slowly recognizing the consequences. Aspects of this reality are explored in some chapters of the *State of the Federation* 2013 volume (Papillon and Juneau 2015).

Intergovernmental mechanisms create opportunities for ministers and officials to interact. It is not straightforward to set such interactions up and maintain them—not like, say, finance or health ministers and deputies who have long-established relationships and committees. There is the forum offered by ministers responsible for local government. This venue can be very useful, but some provincial and territorial governments have been very sensitive about the presence of federal ministers and officials at their local government meetings. But currently there is no infrastructure intergovernmental forum, partly because of the range of provincial and territorial departmental arrangements.

Because there are many stakeholders with an interest in infrastructure, provincial and territorial governments worry that that they will be treated as stakeholders. This has been evident in other sectors, such a healthcare. Unfortunately, federal documents too often carry the phrase "provinces and other stakeholders." The concern around this issue is heightened when the federal government holds consultations.

FINANCING

The chapter by Boadway and Kitchen in this book (chapter 5) deals with the subject of fiscal federalism and infrastructure. This section focuses on the intergovernmental policy decisions that arise in the management of infrastructure programs: the amount of money, its distribution across jurisdictions, the cost-sharing requirements, and the conditions for the transfers and the mechanisms to capture those conditions.

There are few areas of government spending where there is a straightforward analytical or operational answer to how much money should be allocated. This situation applies to infrastructure as well. Of course, there are numbers of varying quality on

infrastructure deficits in various sectors, but those numbers are often aggregations of estimates without priorities or trade-offs. Thus the allocation decision is really a function of the judgment the minister of finance is prepared to make based on political considerations and the advice of his officials and sometimes with input from infrastructure officials. (The budget process is of course more complicated.)

Decision makers then face the classic federal question, namely, how to allocate the funds across the country. Only to good projects wherever they may be? This is not a realistic view of how the country works. This point is not only applicable to federal-provincial dynamics but also to intra-federal Cabinet and government caucus dynamics. Since there is no practical definition of infrastructure need across the country, money is distributed to provinces and territories (more on small jurisdictions in the next section) on a more or less equal per capita basis. The resulting envelopes are then allocated to projects based on bilateral agreements.

Typically, the federal government expects that provincial and territorial governments will pay 50 percent of the cost of a project, or 33 percent if a municipal government also contributes. This expectation has not usually been controversial.

What conditions should accompany federal funds? By definition, the purposes of projects are not among the conditions if they are chosen by mutual agreement. But conditions can still be envisaged on matters such as procurement, communications, official languages, rate and method of disbursement, and reporting. These conditions can be contained in contribution agreements which are also used by the federal government—for example, to provide money to many non-government organizations.

DELIVERY

In principle, the federal government could deliver projects itself. The result would almost certainly be a narrowing of the scope of projects to federally owned infrastructure and to projects within its jurisdiction. For instance, border infrastructure generally needs to be improved, although some of the access infrastructure is within provincial jurisdiction. The federal government could seek to fund directly projects delivered by municipal governments. Apart from its inefficiency, this arrangement would raise serious objections by the provinces unless a prior agreement had been negotiated (which is what happened for the Year 2000 projects in Quebec). Here we are talking of small projects hopefully beneficial to local communities but hardly of the scale that would deal with the country's major infrastructure challenges and have an economic impact.

Project agreements cover environmental assessments, procurement, the structure of public-private partnerships if applicable, communications and signage, cost-sharing, and financial flows.

One can see the potential for intergovernmental conflict under several of those headings, but normally any disagreement is around how roles in funding will be

communicated (and with Quebec, in what language, although a simple solution is available in this case: "The relevant language laws will apply").

The difficult substantive negotiations on the nature of projects and on funding are completed before the work on the text of an agreement begins. Funding can become an issue when an attempt is made to capture in writing issues that are sometimes ignored, such as how cost overruns will be covered. The typical federal position, very hard to hold for very long, is that provinces are implementing agents and should pay the extra costs.

An interesting sidebar on delivery relates to the differences between federal-provincial-territorial discussions and federal-municipal relations. When a federal official tells provincial or territorial officials that such-and-such a decision must await "Treasury Board consideration," they understand each other. Treasury Board is an institution that is familiar to both parties. Municipal officials on the other hand might have heard of this institution and its roles, but they work within completely different institutions, which can lead to misunderstandings. Another difference is that federal and provincial-territorial officials are normally comfortable holding confidential discussions and referring issues to their respective ministers when the time comes. Senior municipal officials, however, are more often than not unable to withhold even tentative information from councils, thus putting their federal (and presumably provincial) colleagues in an awkward position. A final example is the role of mayors. Mayors frequently wish to be themselves the official face of their government, whereas federal officials would be more comfortable dealing with city managers. They assume that disagreements would be resolved by mayors and ministers. These differences need to be recognized and overcome if the relationships are to continue and operate smoothly.

Overall, then, delivery is not a conflictual area largely because it is clear that provincial and territorial governments, and sometimes municipal governments, are the *maîtres d'oeuvre*, as the French engineering term goes, and the federal government has, or should have, no desire to play that role.

Nevertheless, there are important supporting federal roles. The federal government is in a good position to monitor projects across the country in order to ensure that lessons from projects are captured and disseminated. The same idea applies to the collection of uniform data by Statistics Canada. And, typically, the federal government has more resources to devote to research in this area, as it does in others, without necessarily raising questions of jurisdiction. In particular, policy research is necessary on matters such as the management of projects to minimize delays and cost over-runs, and on community impacts and possible policy responses.

THE CASE STUDY

The story of the first four years of the contemporary federal approach to infrastructure is told here more or less based on the categories employed so far in this

paper. The author's role as the first deputy minister of infrastructure, from 2002 to 2006, has the advantage of insider knowledge but the disadvantage of possible bias.

In one form or another, the Government of Canada has been involved in infrastructure spending for many years. Some of the better-known examples are the Trans-Canada Highway and the St. Lawrence Seaway in the 1950s (Vance 2006). More recently, the Liberal government elected in 1993 launched an infrastructure program designed mainly to create jobs (Liberal Party of Canada 1993).

In December 2001, the same government took a significant step by announcing in its budget the Canada Strategic Infrastructure Fund (CSIF) and creating the Department of Infrastructure known as Infrastructure Canada. It built up its bureaucratic capacity based on a very small secretariat located in the Treasury Board Secretariat. The department had its own minister (initially the deputy prime minister, John Manley, who had many other responsibilities). It inherited a Municipal-Rural Infrastructure Fund administered jointly on its behalf by the federal regional development agencies, and by Industry Canada in most of Ontario. Major projects under CSIF were rapidly identified and eventually started—some rapidly, some slowly, and some very slowly.

The most noteworthy projects of the period were, from west to east, the Canada Line in Vancouver, the completion of the Trans-Canada Highway bypass of Calgary, the cleaning up of Wascana Lake in Regina, the completion of the Winnipeg floodway, a major infusion of funds into the Toronto Transit Commission, the completion of Highway 30 around the southeast of Montreal, the twinning of the Trans-Canada Highway in New Brunswick, wastewater plants for the Halifax and St. John's harbours and in Prince Edward Island, social housing in Nunavut, and winter roads in the NWT and Yukon.

When John Manley became minister of finance in May 2002, Allan Rock became minister responsible for infrastructure in addition to his position as minister of industry. In the 2003 budget brought down by Minister Manley, CSIF was supplemented to the tune of another $2 billion. When Prime Minister Martin formed his first cabinet, he appointed Andy Scott as minister of state for infrastructure in the environment portfolio. In mid-2004, the prime minister appointed John Godfrey as minister of state for infrastructure and communities with the responsibility of implementing the New Deal for Cities and Communities. As a result, the minister's priority was the transfer of a portion of the federal gas tax to Canadian municipalities. (A portion of the gas tax actually became a fixed amount.) The other components of the New Deal began to emerge towards the end of 2005, but the government of Paul Martin was defeated in early 2006, and, to no one's surprise, the New Deal was dropped as a federal priority.

How Were Purposes and Priorities Handled in the Beginning?

Chapter 6 of the 2001 budget bill provided the list of purposes to which the funds could be devoted, as quoted earlier in this paper. Projects were meant to be cost-shared, large, and "strategic." It became clear, however, that the categories were not discriminating enough. Over time, Infrastructure Canada narrowed the highway category by focusing on highways designed to improve international or interprovincial trade.

Early on, another theme emerged. The Chrétien government had begun to struggle with a climate change strategy. Views ranged from the extent to which the strategic projects should be entirely or partially dedicated to the reduction of greenhouse gases. In the end, a modest approach was adopted that included the intention to at least estimate the impact on greenhouse gases and in some cases to actively favour projects that were believed to make a contribution to that goal, such as public transit projects.

On the priorities front, the success was greater. A good illustration of the trade-offs is provided by the case of Manitoba: floodway completion, or Museum of Human Rights? There is of course no analytical solution to this choice. In the end, both were done, to the credit of those involved. Initially, however, the decision was to use CSIF money for the floodway and later another source of funds for the museum.

How Were Decisions Made?

Almost the first questions to be addressed in designing the program was how much of the total $2 billion would be allocated to each province and territory. As noted above, roughly equal per capita provincial envelopes were calculated with a floor for the three territories where a per capita allocation would not have been enough for even a short stretch of sidewalk. Given the size of the total pot, creating this floor barely affected the shares of each province, although over time some still objected to the floors, to no avail.

Projects were chosen as a result of discussions between federal, provincial, and municipal elected officials, although the latter were not always deeply involved, even when the projects were in effect municipal. Before ministers agreed on projects, there were several discussions among federal and provincial officials to identify the projects and, hopefully, their costs and timelines. Back-and-forth internal and bilateral discussions on the latter issues often continued after projects had been announced.

Attempting to cost the projects adequately was often an issue because of the pressure of announcements. Once broad agreement was reached on a project, ministers wanted to make an announcement as soon as possible, especially for projects that had

been talked about for years (e.g., Highway 30 around the island of Montreal). The minister of infrastructure had the authority to select the projects following discussions with provincial governments in consultation with federal regional ministers. Contribution agreements, however, had to be approved by Treasury Board ministers. How did the process with provinces and territories actually start? Basically, as the deputy minister, initially almost without staff, I started calling provincial intergovernmental affairs officials to find out who my interlocutors would be. It helped that I been a senior official in the federal Department of Intergovernmental Affairs until about a year earlier. Some provincial officials must have done the same in reverse, because they found me before I found them. The position of my interlocutors varied significantly across provincial and territorial governments. To illustrate, in British Columbia, I dealt with the deputy to the premier, in Quebec with an assistant deputy minister of finance, in some provinces, with the deputy minister of transport. In Ontario, however, I dealt with the deputy minister of the dedicated infrastructure ministry "SuperBuild," and later with Public Infrastructure Renewal.

Discussions on projects were held with provinces individually, but of course provincial officials across the country were in touch with each other as the process unfolded (although a good hypothesis would be that the provinces talk to each other more than federal officials would like but less than they think).

There were also extensive discussions (not negotiations) with the Federation of Canadian Municipalities, provincial municipal associations, and several municipalities. Minister Godfrey and his staff had already been in close contact with the municipal world when he served as Prime Minister Martin's parliamentary secretary for cities before becoming the minister of state. When negotiations with the provinces and territories on the transfer of a portion of the federal gas tax started, there were many informal contacts with cities and municipalities. These were made easier as a result of contacts related to infrastructure projects.

How Funded?

In the period covered by this study, the amounts to be allocated were not contentious from an intergovernmental point of view, but after a few years the Federation of Canadian Municipalities and municipal governments started to argue that much more long-term certainty in federal funding was needed. This issue became one of the key selling points of the gas tax transfer promised by Prime Minister Martin.

Some provinces argued that the importance of their preferred projects dictated that they receive more than their per capita share. Allocations being a zero-sum game, this argument was generally not sustainable, with one important exception. The federal minister who had to recommend an allocation to the completion of the Winnipeg floodway concluded that the project was of such importance that it

should receive part its federal funding from a "national projects" portion of the overall budget.

The practical funding issue that surfaced fairly early was that the funds would not likely be spent in the fiscal years envisaged by the budget. It was rapidly agreed, to the great relief of Infrastructure Canada and its provincial and municipal partners, that unexpended funds at the end of a fiscal year would be rolled into the next and therefore not be subject to the usual rule that lapsed funds are returned to the consolidated revenue fund. It was recognized that it is in the nature of projects that their annual spending cannot be precisely predicted and that disbursements will be slower than expected.

The cost-sharing provisions of the programs were not controversial. The split was 50-50 when the projects was federal-provincial or federal-territorial and 33-33-33 when a municipality was involved. Apart from the obvious point that this split was consistent with past practice in many sectors, the care taken to choose projects that met the priorities of all the relevant governments was surely helpful.

Part of the decision making included communications. Governments' eagerness to make infrastructure announcements as soon as possible after projects have been agreed to complicates the task of providing adequate cost estimates. For example, when announcements are made, technical challenges are not necessarily known, especially when, say, tunnelling is involved. The full cost of expropriations may also be unknown, to say nothing of the inevitable delays in such processes, which may lead to missing a construction season.

How Delivered?

The central point here is that provinces, territories, and municipalities are the infrastructure *maîtres d'oeuvre*. This position is consistent with provincial-territorial jurisdiction and expertise. Provinces, territories, and municipalities are responsible for the design of projects, for procurement, and for execution. Nevertheless, as noted above, projects are carefully defined in contribution agreements that are a typical federal instrument to govern financial transfers in numerous situations. Provinces sometimes expressed frustration at being subject to such detailed documents, which seemed to them to be more relevant to other types of federal relationships. In any event, contribution agreements are elaborate documents scrutinized by federal lawyers and Treasury Board Secretariat officials. They include, in addition to detailed descriptions of projects, the financial arrangements such as the treatment of cost over-runs, requirements that the procurement process be transparent and competitive, communications commitments on signage and such, and language requirements for those communications.

For the some of the major projects, governments agreed that they should be delivered through a public-private partnership. This was the case for the Canada Line, a rapid transit project in Vancouver, and for the A-30 around Montreal.

CONCLUSION

From an intergovernmental perspective, in the early years of strategic infrastructure programs, great sums of money were allocated to several valuable projects on the basis of collaboration and cost-sharing. Various factors can be cited for this scale: a huge appetite and need for funding with much public support, in part. As a result, governments took great care in discussions. The latter were handled at all levels by experienced officials. The early years therefore set a useful tone for future years. As usual in Canadian federalism, the field was not and will not be free of tensions, misunderstandings, and conflicts. But in comparison with fields such as healthcare or the fiscal arrangements, this one is a success story.

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9

QUÉBEC'S MANAGEMENT OF PUBLIC INFRASTRUCTURE

Jacques Caron

AN ADEQUATE INVESTMENT PLAN TO ENSURE PUBLIC SERVICES

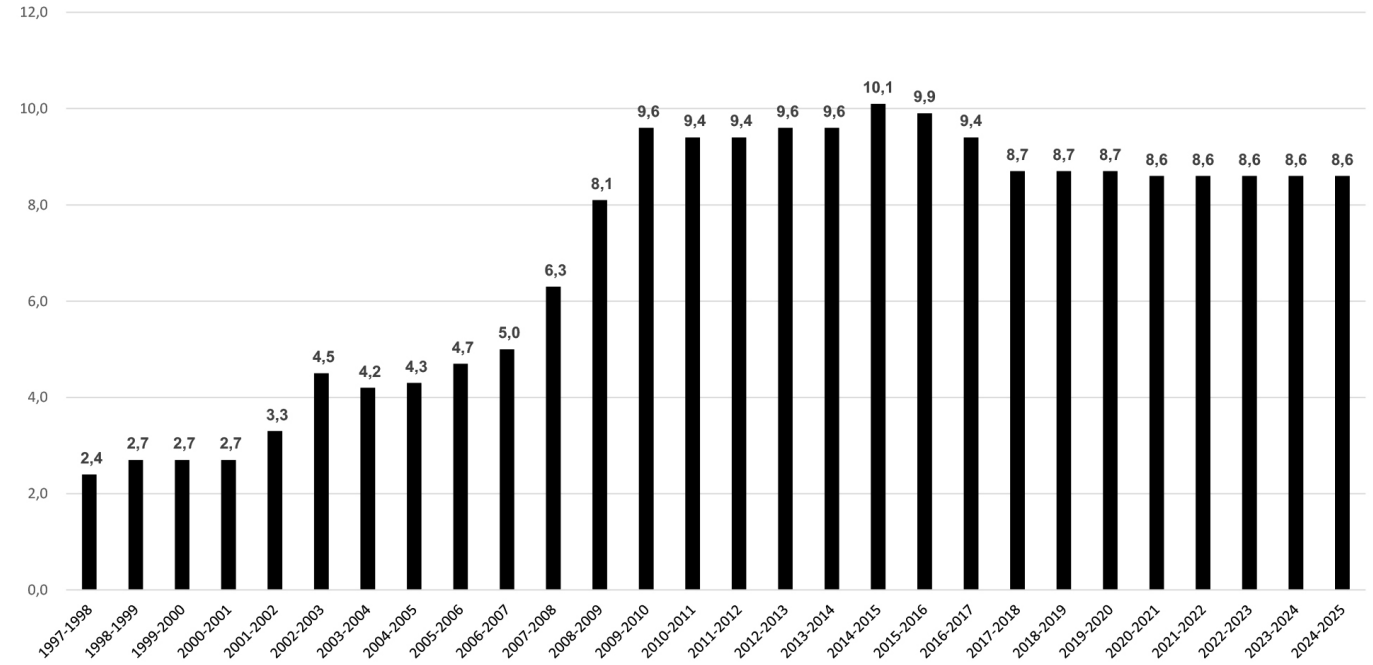
To reduce medium and long-term pressures on debt and public expenditures, the orientations in Québec's 2015–16 budget provided $88.4 billion for the 2015–2025 Québec Infrastructure Plan (QIP), compared to $90.3 billion in 2014–2024. Despite this decrease, based on the government's ability to pay, the amount was sufficient to meet Québec's ever-growing needs in this area. The government must continue to do more with less, meaning that infrastructure governance and planning must continue to improve in order to responsibly manage the available resources. More than ever, the government must make choices, prioritize projects based on clear orientations, and find new ways of investing in Québec's public infrastructures.

A Few More Years of Playing Catch-Up

As in many other jurisdictions in North America and around the world, much of Québec's public infrastructures were built between 1960 and 1980. The many investments made in public infrastructures in that period, particularly in the road network, fuelled the economic development of Québec.

In the years that followed, particularly in the 1990s, the Government of Québec changed its budget orientations in favour of massive investments in social programs. While this shift greatly improved the quality of life of Quebecers, it took up a large share of the available financial and budgetary resources, with the result

Figure 9.1: Annual Change in Public Infrastructure Investments since 1997–98 (Contribution of the Government of Québec, in Billions of Dollars)



Source: Québec Infrastructure Plan.

that investments in public infrastructure fell off sharply until 2006–07. This under-investment in public infrastructures was reflected not only in fewer public infrastructure construction projects but also by a steep decrease in budget allocations to maintaining existing assets, slowly creating a large asset-maintenance deficit.

Following the collapse of Laval's De la Concorde overpass in 2006 and the adoption in 2007 of the Act to Promote the Maintenance and Renewal of Public Infrastructures, the government once again began investing heavily in transportation as well as health and other infrastructures. While it may seem difficult to sustain this pace over the long term, given the combined effect on the debt and expenditures, the 2015–2025 QIP intends to maintain the average level of investments at a sizable $9.1 billion over the next five years and concentrate on infrastructure investments that will maintain the service offered to the public. The government is acting responsibly by stabilizing the average investments in the second five-year period of the 2015–2025 QIP at $8.6 billion and reiterating its prioritization criteria to maximize the return on each dollar invested in this area.

Balanced Investment Planning over Ten Years

The government injects significant funds each year to maintain the quality of existing infrastructure and provide new infrastructure to meet the needs of the public. The needs are great, but some are particularly pressing. Consequently, the government must prioritize projects and ensure a balanced distribution of investments throughout the next two five-year periods in order to promote the sustainability of the infrastructure. Clearly, not all needs can be met at the same time. Consequently, in order to foster the sustainability of infrastructures, the government needs to ensure a balanced distribution of investments throughout the two five-year periods.

Monies Allocated to Priority and Strategic Needs

The government is investing substantial amounts in public infrastructure for the benefit of all Quebecers. The QIP covers different sectors of activity. To this end, nearly 75 percent of funds are allocated for infrastructure in such sectors as transportation, health and social services, education and higher education, as well as for municipal, sports, community and recreational infrastructure.

The 2015–2025 QIP also outlines the type of investments for all sectors of the government. Asset maintenance, elimination of the asset maintenance deficit, replacements, additions and improvements of infrastructure planned for the next ten years are presented according to priority needs.

A significant proportion of the investments provided under the 2015–2025 QIP will be used to ensure the maintenance of the government service offered to the

Figure 9.2: Annual Investments in the 2015–2025 Québec Infrastructure Plan (Contribution of the Government of Québec, in Billions of Dollars)

2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	Total
9.9	9.4	8.7	8.7	8.7	8.6	8.6	8.6	8.6	8.6	88.4

Source: Québec Infrastructure Plan.

public. Other investments will improve the service offered and will especially support Québec's economic development.

CLEAR GOVERNMENT ORIENTATIONS

With its $88.4 billion infrastructure investment program for 2015–2025, the government is ensuring the maintenance of the condition of its infrastructure and the safety of its citizens, while substantially supporting economic growth in Québec and respecting its citizens' ability to pay. Government orientations have been clearly defined to address issues related to public infrastructure and to ensure consistency in its intervention strategy. To do this, the government has developed guidelines for the prioritization of infrastructure investment.

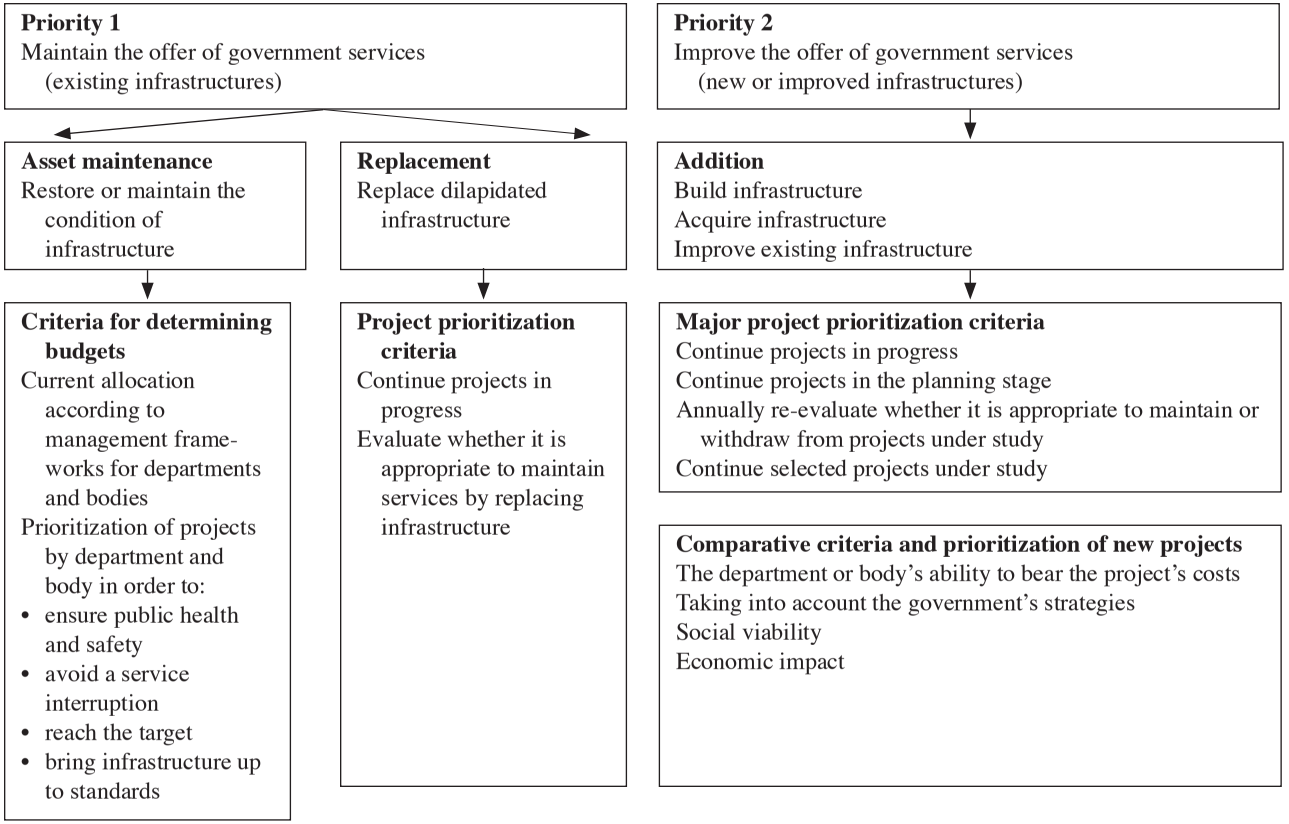
These guidelines clearly demonstrate that projects maintaining the current offer of government services through asset maintenance and the replacement of existing infrastructures are considered a priority. The amounts forecast in the 2015–2025 QIP reflect strategic choices by the government, and the next QIP will reinforce this orientation.

Additional projects improving the offer of government services are selected based on merit and mainly in cases that foster Québec's economic development.

Elements Presented in the Québec Infrastructure Plan

In accordance with the guiding principles behind the prioritization of infrastructure investments, the 2015–2025 QIP presents each type of investment according to whether it maintains or enhances the service offering (see appendix I). The 2015–2025 QIP also schedules a central envelope of $10.7 billion. This envelope is required to eventually fund and implement in the short and medium term the strategic initiatives recognized and prioritized by the government. The government will therefore have to use the central envelope wisely in the fiscal years ahead.

Figure 9.3.1: Guidelines for the Prioritization of Infrastructure Investments



…continued

Figure 9.3.2: Guidelines for the Prioritization of Infrastructure Investments, continued

Criteria for determining budgets
Additional allocation to extend the use of dilapidated infrastructure
Eventual prioritization of certain asset categories according to the target to be determined by the government

Source: Québec Infrastructure Plan.

PROJECTS OF $50 MILLION OR MORE

Public infrastructure projects of $50 million or more constitute a significant part of the 2015–2025 QIP and are prioritized based on strategic needs and subject to the guidelines described above. A total of 154 projects of $50 million or more are distributed among various sectors. The inclusion of these projects in the QIP in various degrees of advancement aligns with decisions made by the government during various stages of progress. The projects are divided into three categories, according to their degree of advancement.

Figure 9.4: Degrees of Advancement

Close to 71 percent of these projects fall under the jurisdiction of the Ministère des Transports and the Ministère de la Santé et des Services sociaux. The projects account for 14.7 percent of the 2015–2025 PQI, but only those projects currently "in the planning stage" or "in progress" have been fully provided for, while projects "under study" have been allocated only the amounts required to conduct the studies. For the duration of the sixty-seven projects already in progress, Québec's contribution is estimated at about $21 billion.

Governance and Decision Process for Major Projects

Under the Public Infrastructure Act (Chapter I8.3), the government adopted the Directive sur la gestion des projets majeurs d'infrastructure publique in February 2014. This directive aims to advance best project management practices in order to make the right investment choices for obtaining quality infrastructures, while complying with established investment limits. It determines the authorizations required and the content of the documents required at the various management stages of the project and in certain cases allows the Société québécoise des infrastructures (SQI) to determine the content of those documents.

A public infrastructure project is considered major if it meets the criteria determined by the Conseil du trésor or if the Conseil du trésor expressly qualifies

Table 9.1: Number of projects of $50 Million or More (under the 2015–2025 Québec Infrastructure Plan, by Sector and by Degree of Advancement)

	In Progress	In the Planning Stage	Under Study	Total
Road network	28	11	20	59
Public transit	9	8	3	20
Marine, air, rail, and other transportation	3	1	2	6
Health and social services	9	8	8	25
Higher education and research	—	2	3	5
Culture	2	—	—	2
Municipal, sports, community, and recreation infrastructures	10	10	3	23
Government buildings	4	4	2	10
Information resources	1	—	—	1
Other sectors	1	1	1	3
Total	67	45	42	154

Note: No project with costs exceeding $50 million are planned for the education sector.
Source: Québec Infrastructure Plan.

it as such. For instance, a public infrastructure project is considered major if its estimated total cost is equal to or exceeds $50 million (or $100 million for a road infrastructure project).

For projects submitted to the directive, the registration of a major project is conditional on the decision of the Council of Ministers. All major projects should be run in those stages (see appendix II).

In the preproject stage, a request to study a major project of a government body, prioritized by the minister to whom the body reports, must be accompanied by a pre-project form. These requests must be authorized by the cabinet in order for an opportunity assessment (OA) to be undertaken.

For projects under study (startup stage), an OA must be carried out by the project manager to determine the relevance of the project and to recommend the best option to meet the stated long-term need. The cabinet approves the OA and then authorizes the preparation of a business case (BC).

Once in the planning stage, a BC must be prepared to present a detailed description of the chosen optimal long-term solution as well as a project management plan outlining the actions required to carry out the project. The cabinet approves the BC and then authorizes the execution of the project.

During the execution stage, the project manager must produce summary reports on the progress of the project and submit them to the Secrétariat du Conseil du trésor. Each report must be produced every six months. Moreover, all significant modifications to the project that affect the total cost, funding strategy, scope or timeline of the project must be authorized by the Council of Ministers.

The rules are clear: any anticipated significant overshoot in the realization of a major project must be submitted to the Council of Ministers, with a recorded budget or reduced range.

At the end of a project, the project manager must produce a project closure report and deliver it to the Secrétariat du Conseil du trésor immediately upon the formal delivery of the public infrastructure.

This mechanism respects a rigorous project management based on internationally recognized best practices, helps the government to make the right choices, and enables the Council of Ministers to intervene early in the process to agree on the relevance of a major project.

EVOLVING GOVERNANCE RULES

The Public Infrastructure Act and the Directive sur la gestion des projets majeurs d'infrastructure publique have established governance rules for planning infrastructure investments as well as for the management of public infrastructures. Since 2014, the Secrétariat du Conseil du trésor has been working toward developing governance rules and therefore improving the monitoring and performance of strategic projects under the Québec Infrastructure Plan.

To ensure leadership in the governance of major projects, governance committee meetings are held regularly. The meetings allow the government to be better informed about major projects, particularly those involving a high level of risk and important issues. With better information, it is possible to propose targeted actions to appropriate departments and bodies and to ensure more rigorous monitoring.

New Governance Rules for Projects under $50 Million

In the document tabled with the 2015–2025 QIP, the government announced the start of work to update the overall picture of the practices and processes of its departments and bodies. For infrastructure projects of under $50 million, a new management process will be presented in the near future with a view to wide consultation with

the departments and bodies concerned. Once the necessary adjustments are made, the new process should be implemented.

Stricter Rules for Certain Projects outside the Government's Reporting Entity

The QIP is a planning tool for all government-funded investments, whether the entities are or are not included in the government's reporting entity. For those projects included, such as Québec hospitals, universities, and school boards, the government has designed a very strict process to ensure sound management practices are applied in accordance with the Directive sur la gestion des projets majeurs d'infrastructure publique for projects of $50 million and more.

The directive does not automatically apply to public infrastructure investment projects involving public transit corporations and municipalities. The government must therefore proceed with a separate designation in each case, following a differentiated regulatory framework. In light of the major amounts involved in this infrastructure category and the importance of ensuring that projects of $50 million and more adhere to the same sound practices as those concerning infrastructure belonging to the government, work will be carried out with a view to implement an appropriate approval process for these infrastructures.

Continuous Improvement in Transparency

The Québec government has accomplished a series of concrete actions to enhance the transparency of its infrastructure budget documents, in particular by publishing a list of all projects of $50 million and more, and by including in the 2015–2016 budget the Annual Management Plans for Public Infrastructure Investments.

Supplement 9A
Summary Presentation Tables of Investments Under the 20152025 Québec Infrastructure Plan

Table 9.2.1: 2015–2025 Québec Infrastructure Investments by Sector and by Type of Investment (contribution of the Gouvernement du Québec, in millions of dollars)

Sector	Maintenance of the Service Offer[1]						Enhancement of the Service Offer				QIP 2015–2025
	Asset Maintenance	Elimination of the Asset Maintenance Deficit	Replacement	Provisions and Central Envelope[2]	Studies	Subtotal	Additions and Improvement	Provisions and Central Envelope[2]	Studies	Subtotal	
Road Network	9,975.4	—	3,727.1	—	107.1	13,809.7	2,815.8	—	29.8	2,845.6	16,655.3
Public Transit	1,990.8	—	1,607.3	—	—	3,598.2	3,561.7	—	87.8	3,649.5	7,247.7
Marine, Air, Rail, and other Transportation	812.7	—	150.9	140.0	—	1,103.7	834.6	225.0	1.5	1,061.0	2,164.7
Health and Social Services	2,998.0	2,420.8	4,845.9	—	—	10,264.8	3,742.4	406.6	23.0	4,172.0	14,436.8
Education	5,767.6	1,013.5	133.0	89.8	—	7,003.9	1,768.9	—	—	1,768.9	8,772.9
Higher Education and Research	3,344.0	1,092.0	1,191.2	—	—	5,627.2	811.9	84.1	6.5	902.5	6,529.6
Culture	414.1	167.9	797.0	—	0.5	1,379.5	177.4	93.3	—	270.7	1,650.2
Municipal, Sports, Community and Recreation Infrastructure	3,410.4	1,006.8	1,365.3	432.3	4.8	6,219.6	1,705.7	287.8	1.0	1,994.5	8,214.1

…continued

Table 9.2.2: 2015–2025 Québec Infrastructure Investments by Sector and by Type of Investment (contribution of the Gouvernement du Québec, in millions of dollars)

Sector	Maintenance of the Service Offer[1]						Enhancement of the Service Offer				QIP 2015–2025
	Asset Maintenance	Elimination of the Asset Maintenance Deficit	Replacement	Provisions and Central Envelope[2]	Studies	Subtotal	Additions and Improvement	Provisions and Central Envelope[2]	Studies	Subtotal	
Social and Community Housing	684.5	346.9	—	—	—	1,031.4	841.0	141.1	—	982.1	2,013.5
Government Buildings	1,172.5	—	133.4	—	—	1,305.9	968.0	164.5	2.7	1,135.2	2,441.1
Information Resources	40.1	—	296.2	226.3	—	562.6	2,750.6	—	—	2,750.6	3,313.2
Other Sectors	703.1	—	252.0	283.4	—	1,238.4	2,238.7	822.4	10.9	3,071.9	4,310.4
Subtotal	31,313.4	6,047.8	14,499.5	1,171.7	112.3	53,144.7	22,216.7	2,224.8	163.0	24,604.5	77,749.2
Central Envelope[2]	—	—	—	6,391.5	15.0	6,406.5	—	4,234.3	10.0	4,244.3	10,650.8
QIP 2015–2025	31,313.4	6,047.8	14,499.5	7,563.2	127.3	59,551.2	22,216.7	6,459.1	173.0	28,848.8	88,400.0

Note: Figures are rounded and the sum of the amounts may not correspond to the total.

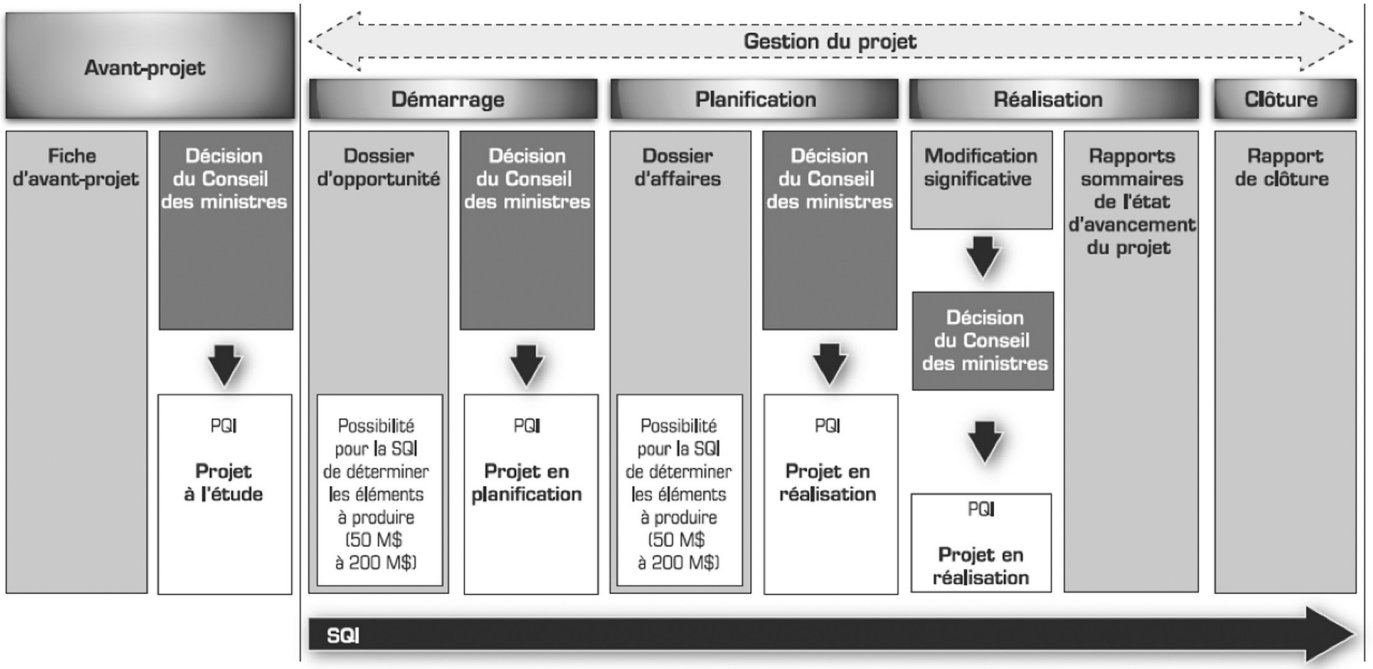
1 The amounts recorded for asset maintenance and the elimination of the asset maintenance deficit were not necessarily determined in compliance with the new definitions contained in the guidelines issued by the Secrétariat du Conseil du trésor in 2014–2015. Therefore, these amounts, as well as those allocated for replacement, may contribute to eliminating the asset maintenance deficit. More accurate amounts will be presented progressively in the next Québec Infrastructure Plans.

2 Envelope reserved for projects that are currently under study and potential projects that have not yet been determined by the government.

Source: Québec Infrastructure Plan.

Supplement 9B

Figure 9.5: Governance and Decision Process



Source: Québec Infrastructure Plan.

10

IN DEFENCE OF BORROWING

Kyle Hanniman[1]

Canadian municipalities face a major, if ill-defined, infrastructure deficit. Local governments have been trying to plug this gap, in part, by borrowing. For some observers, this strategy makes perfect sense. Interest rates are low and infrastructure-starved cities would be foolish not to exploit them. For others, municipal borrowing is a major cause for concern. In general, credit conditions have never been better, but they have also become more volatile and there have been times, in recent years, when provinces and municipalities have had difficulty borrowing. These moments have been infrequent and, for the most part, short lived. But they—along with perennial fears of interest-rate spikes and the divergence in federal and subnational borrowing costs—have prompted some to call for a smaller role for municipal borrowing. Are Canadian municipalities wise to borrow under these conditions? Are senior levels of government wise to let them?

The answer is a qualified yes. Borrowing is an equitable and efficient way to finance long-term capital investments, and decentralized borrowing enhances the accountability of local fiscal decisions. These benefits must be weighed against the costs of decentralization, which include higher borrowing costs and the risk of market closure. But Canadian municipalities continue to borrow at rock-bottom rates, and if and when rates do rise, they can manage the fallout. Their debts are a fraction of provincial liabilities; they assume virtually zero refinancing risk; they borrow at fixed rates;[2] and they can step away from markets in a way that provinces—which

1. I would like to thank John Allan, Richard Bird, Matti Siemiatycki, and Enid Slack for comments on previous drafts. I would also like to thank BMO Capital Markets for generously supplying data, and anonymous sources at several Canadian banks for providing information on recent developments in provincial and municipal bond markets.

2. That is, the rates for individual governments do not vary across the life of the bond, as they would, for example, with a variable rate debenture. It is not to suggest that rates are the same for all municipal borrowers.

borrow to finance healthcare and other sensitive services—cannot. These conditions suggest that observers ought to worry less about the rise of municipal debt, which has been modest,[3] and more about the particulars of borrowing decisions. Are particular municipalities borrowing too much? Are they borrowing too little? Do they have the revenues to service debts and operate and maintain new assets? But we should also ask what, if any, role the federal government should play in stabilizing or lowering municipal rates, especially in light of recent volatility in capital markets.

The next section of this chapter develops the theoretical case for municipal borrowing. The discussion then addresses more practical matters, including whether municipalities borrow responsibly, whether they can borrow at affordable and stable rates, and what role the federal government might play in municipal lending. The final section presents the conclusions.

THE CASE FOR MUNICIPAL BORROWING

The theoretical case for financing infrastructure is simple. Investments in transit systems, wastewater treatment plants, and other long-term capital assets are lumpy. They involve significant upfront costs, which, if paid entirely from government revenues, current taxpayers alone would have to bear. But these assets generate long-term benefits that future users enjoy as well. Borrowing provides a solution to this inter-generational quandary: it transforms immediate costs into debt charges, which cities can spread across an asset's multi-generational user base.

This rationale is consistent with the benefit principle.[4] But Dahlby and Smart (2015) have raised legitimate concerns with debt financing (not the benefit principle). First, they note the troubling lack of inter-generational accountability that debt financing entails: it distributes the costs of infrastructure across current and future users, but denies the latter any influence over investment decisions. Second, they argue that current users disproportionately benefit. They estimate the inter-generational benefits of Alberta's existing infrastructure and find that benefits accrue overwhelmingly to current users[5] (though one can, as is always the case with these

3. This is not to say, however, that there are no differences in municipal debt. Quebec municipalities tend to borrow more than municipalities in other provinces and some rapidly growing municipalities, such as the York Region, have been allowed to borrow beyond provincial limits.

4. There are, of course, additional justifications for borrowing, including macroeconomic stabilization, but these tasks are best left to central governments.

5. The authors also argue that the distribution of costs is difficult to discern. It depends on whether debt is domestically or internationally held, although in the case of municipalities the vast majority of debt is held domestically. As of 16 September 2016, non-resident

exercises, question assumptions about discount rates, capital depreciation, and other model inputs).

Dahlby and Smart's concerns are primarily limited to two categories of investment: (1) assets that do not generate user fees but that are believed to generate additional tax revenue by boosting private sector activity (e.g., schools and non-tolled highways); and (2) projects that do not generate any additional revenues but provide clear social benefits (e.g., hospitals and public parks). The problem is that these categories are not self-liquidating: that is, they do not generate enough revenues to cover their costs. (Dahlby and Smart assume this is generally true of projects that boost private-sector output.[6]) Projects paid by user fees can cover costs, but most provincial assets—the primary focus of their study—are not financed this way (9).

Municipal projects often are financed this way, however, and the difference is due in part to basic differences in provincial and municipal services. Provinces are responsible for education, healthcare, and other polices that, because of their redistributive nature, are generally funded through taxation, whereas cities are responsible for transit, wastewater, and a number of other services that can be funded in significant measure (though rarely fully) by user fees. The scope for borrowing is therefore arguably broader at the municipal level.

The case is stronger still, perhaps, when one considers the size of projects relative to municipal budgets. Ideally, governments would pay for "non-feeable" projects with tax dollars or, where appropriate, transfers from higher levels of government. But the political and fiscal costs of this approach are often immense, particularly at the municipal level where the costs of water treatment facilities and other once-in-a-generation investments can overwhelm capital budgets in any given year. Borrowing provides a reasonable alternative in these cases, provided, of course, that governments raise the requisite revenues to service debts and operate and maintain new assets, which municipalities generally do. One must be cautious, however, about taking this logic too far. It can easily go from a principled argument about ensuring adequate investment in the face of voter myopia or short-term budget constraints to a means of shifting costs onto future generations—particularly if, as Dahlby and Smart argue, the benefits overwhelmingly accrue to today's users.[7]

In short, the case for debt-financing municipal infrastructure is sound. But why borrow at the municipal level? Why not have the federal government—which

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holdings of municipal bonds accounted for roughly 12 percent of total holdings (Lovely 2016a).

6. The increase in output has to be very high, the authors note, before it generates enough tax revenues to offset project costs. Spending on public investment can also undermine private investment, in which case the net impact on tax revenues may be small, neutral, or even negative.

7. I would like to thank Richard Bird for raising this point.

borrows at lower rates—borrow on cities' behalf? One reason is that borrowing subjects local governments to market discipline (Rodden 2006). If municipalities behave irresponsibly, they will pay the costs through higher borrowing costs and lower credit ratings (though as I explain below, this rationale is weaker in Canada than in other contexts).

A better argument is that local borrowing—like many forms of decentralization—improves government decision making. Local politicians are directly accountable to local voters. They also have better knowledge of local preferences and conditions. They are in a better position, therefore, to address local infrastructure needs. The federal government, by contrast, lacks basic knowledge of local conditions and depends on national rather than local coalitions for re-election. Not surprisingly, its priorities often differ from those of local governments, who would need to comply with federal conditions to receive federal loans. Local decisions could look very different, therefore, if municipalities were to borrow from the federal government.

Of course, federal conditions need not be detailed. Ottawa can define general categories of investment and leave the design and selection of projects to local officials (more on this below). But even general criteria can distort local decisions. A similar problem potentially arises when provinces lend to municipalities, but the presumption is that provinces are more attuned and accountable to local needs.

This is not to suggest the federal government should never lend to municipalities. Indeed, it may be justified, as I explain below, when local credit conditions deteriorate. But federal involvement creates risks and therefore requires careful justification.

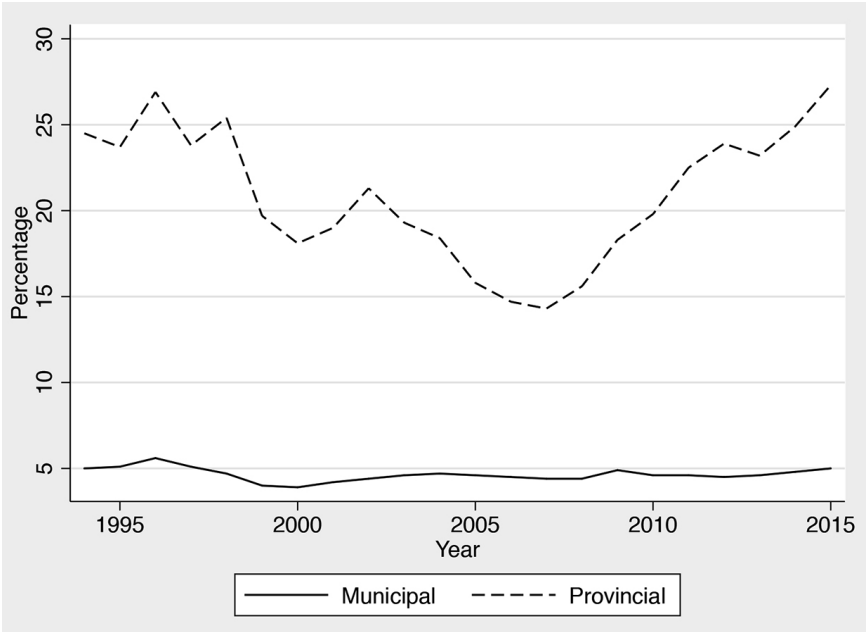
PRACTICAL CONSIDERATIONS

The normative case for local borrowing is compelling: debt allows governments to spread the costs of long-term assets across their multi-generational user base, and local financing enhances the quality and accountability of investment decisions. But these advantages are not in and of themselves sufficient grounds for letting cities borrow. A number of other questions also come into play. Chief among these are whether municipalities have incentives or the legal obligation to borrow responsibly and whether they can borrow at affordable and stable rates. I discuss each of these issues in turn.

Ensuring Fiscal Discipline

Responsible borrowing is enforced in one of two broad ways (Rodden 2006; Rodden, Eskeland, and Litvack 2002; Ter-Minassian and Craig 1997). The first is market discipline, in which bondholders and rating agencies punish profligate

Figure 10.1: Net Municipal and Provincial Debt as a Percentage of GDP



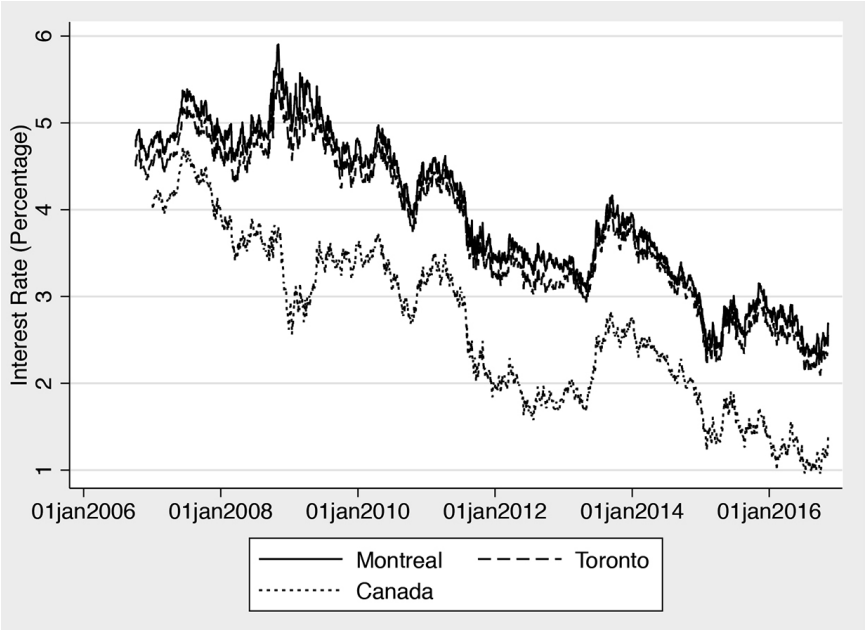
Source: Cansim Table 385-0032 and author's calculations.

borrowers by raising interest rates and lowering credit ratings (Lane 1993). The second, which can work in tandem with market discipline, is some form of hierarchical discipline, in which higher levels of government (provinces, in the case of Canadian municipalities) constrain borrowing and other local fiscal decisions.

In Canada, market discipline is limited for municipalities because of the belief (held among investors and credit rating agencies) that municipal debts are provincially guaranteed (Bird and Tassonyi 2001; Hanniman 2015a). This allows municipalities to borrow on similar terms as provinces, despite the fact that provinces regulate municipal borrowing and despite the fact that provinces enjoy significantly higher revenue-raising capacities. (Of course, the fact that municipalities are not nearly as indebted as provinces also plays a role.) Markets also assume that Ottawa guarantees provincial debts, which narrows the risk premiums on federal, provincial and municipal bonds considerably (Hanniman 2013; 2015a).

This implicit guarantee explains, in part, why Canada's provincial sector is so massively indebted (Hanniman 2015a). It has not, however, led to excessive borrowing at the municipal level. Municipal debts are a fraction of provincial liabilities (see Figure 10.1) and provincial rules prevent cities from borrowing to

Figure 10.2: Interest Rates on Ten-Year Bonds of Selected Government Borrowers



Source: BMO Capital Markets and author's calculations.

excess (Amborski and Nichols 2010; Bird and Slack 1993; Bird and Tassonyi 2001). Municipalities also borrow at fixed interest rates,[8] issue exclusively in Canadian currency, assume virtually zero refinancing risk,[9] and have the capacity to reduce borrowing in a way that provinces—which borrow to finance infrastructure *and* government services—cannot. A sharp increase in interest rates would not, therefore,

8. "Fixed" here means that municipalities opt for fixed-rate rather than variable-rate bonds, the interest rate on which does not change over the life of the bond. It does not imply that all municipalities borrow at the same rates.

9. The principal on municipal bonds is typically amortized in the case of small borrowers, which tend to issue serial bonds, or it is repaid by sinking-fund revenues in the case of large borrowers, which tend to issue bonds with bullet maturities in which all principal comes due on the day of maturity (Hanniman 2015a). This is the main reason why municipalities face virtually no refinancing risk.

Table 10.1: Federal Spreads and Borrowing Costs for Selected Canadian Governments

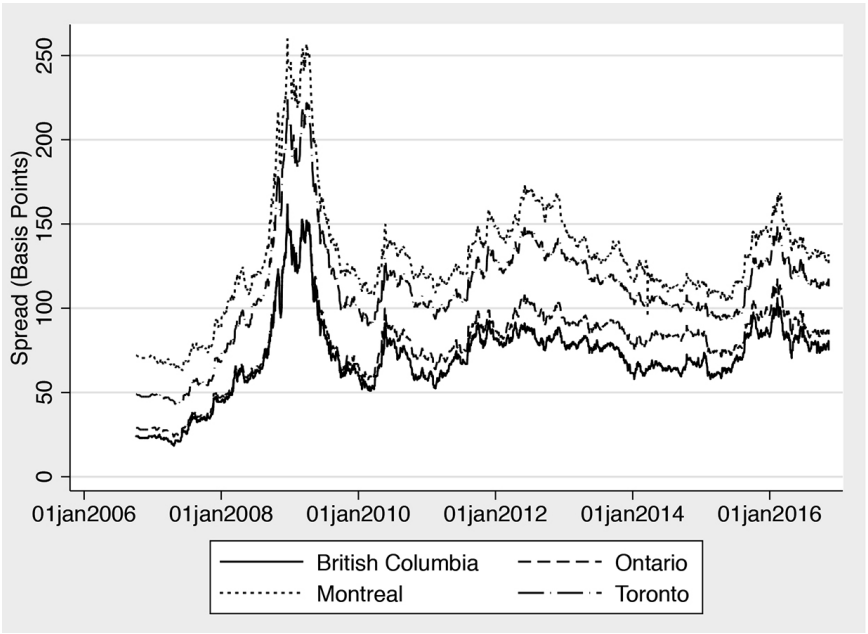
Issuer	10-Year Spread (a)	20-Year Spread (a)	10-Year Rate	20-Year Rate
Canada	—	—	1.24	1.90
Ontario	0.94	1.05	2.18	2.96
York	1.22	1.42	2.46	3.32
Peel	1.22	1.42	2.46	3.32
Toronto	1.24	1.45	2.48	3.35
Winnipeg	1.34	1.54	2.57	3.44
Montreal	1.42	1.57	2.66	3.48

Figures refer to daily averages of constant maturity bonds from 12 November 2015 to 10 November 2016. Spread (a) refers to the annual interest rate the borrower pays over Government of Canada bonds.
Source: BMO Capital markets and author's calculations.

trigger a repayments crisis. It could, however, undermine local capacity to borrow for infrastructure, a risk I address below.[10]

10. Of course, a low probability of default is a crude indicator of fiscal responsibility. We do not merely want governments to remain solvent: we also want them to borrow for the right projects. This, perhaps, is where the risks of limited market discipline become apparent. Canadian cities do not issue revenue bonds, the repayment of which comes from revenue streams tied to specific infrastructure projects, e.g., user fees. Rather, they issue general obligation bonds, the repayment of which comes from general government revenue. The risk premium on municipal bonds is not, therefore, a reflection of the risks or viability of particular projects. Instead, it reflects the government's general ability to honour its debts. This, along with the provinces' implicit bailout guarantee, gives municipalities scope to finance unviable projects. A potential remedy is to require municipalities to issue revenue bonds. But provinces have shown little interest in this instrument—"Toronto is the only city permitted to issue them" (Kitchen and Lindsey 2013)—and even if they did, it is not clear whether it would work. Lenders would have to assume that revenue bonds were allowed to default, but that seems unlikely given Canada's general system of implicit bailout guarantees.

Figure 10.3: Ten-Year Subnational-Federal Bond Spreads for Selected Borrowers



Source: BMO Capital Markets and author's calculations.

Ensuring Stable and Affordable Access to Credit

One might assume, given the low interest rate environment and municipalities' low levels of default risk, that Canadian municipalities have little difficulty accessing credit. In general, this is true, but access is not guaranteed, particularly when global credit markets become unhinged, which they have at various point in recent years.

Figure 10.2 displays the interest rates on ten-year constant maturity bonds for Canada and for two of Canada's largest municipal borrowers, Toronto and Montreal.[11] Borrowing costs rose during the global financial crisis (the spike in 2008 corresponds with the Lehman Brothers default), but declined dramatically thereafter. As of 10 November 2016, Toronto could borrow at a fixed rate of 2.56 percent, while Montreal (generally considered the least creditworthy of Canada's major municipal borrowers) could lock in at 2.68 percent.

11. The yields are neither secondary nor primary market data, but estimates of what a borrower would pay if it were to issue a bond on a given day. They come from BMO capital markets, a major underwriter and market maker of municipal and provincial debt.

Table 10.1 displays average ten- and twenty-year interest rates for five Canadian municipalities in 2016. The averages range from 2.46 percent to 2.66 percent on ten-year debt and 3.32 percent to 3.48 percent on twenty-year bonds. These are some of Canada's largest municipal borrowers. Their bonds are the most liquid, and their borrowing costs therefore tend to be lower than those of small issuers. But small municipalities have also seen their borrowing costs decline, and most have the option of borrowing from provincial agencies or lending authorities.[12] Thus, differences in subnational borrowing costs are generally small.

But the success of municipal borrowers is qualified in two ways. First, while borrowing costs have fallen for all governments, they have fallen most significantly at the federal level. Figure 10.3 displays the spread (measured in basis points) that Ontario and major municipal borrowers paid over the government of Canada from 5 October 2006 to 10 November 2016. Spreads increased sharply at the onset of the crisis in 2008 and have yet to return to pre-crisis levels.[13] Second, credit conditions have become much more volatile. Volatility increased in late 2008 (again, see Figure 10.3) and there have been brief periods, as I explain below, in which provinces and municipalities have had difficulty borrowing.

What factors account for spread widening and volatility? The most intuitive explanation is changes in relative creditworthiness. As the creditworthiness of various borrowers diverge, borrowing costs and access should as well. No doubt creditworthiness accounts for some of the changes in Figure 10.3, but it fails to account for the biggest shifts. Take, for example, the period from late 2015 to early 2016: the federal deficit increased during this time, while Ontario and Quebec's fell. Ontario and Quebec's spreads should—if creditworthiness were the only relevant factor—have fallen. Instead, they widened by a significant margin.

Creditworthiness does an even poorer job of explaining municipal developments. While provincial credit ratings have, on net, deteriorated since the global financial crisis, municipal ratings have improved. Only two municipalities were downgraded between January 2008 and February 2014 and only by a single notch in each case.[14] Meanwhile, fifteen (or 36 percent) of rated entities were upgraded at least once.[15]

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12. Examples include Infrastructure Ontario and the Municipal Finance Authority of British Columbia.

13. On ten-year bonds, spreads have gone from under 70 to 126 basis points on 10 November 2016 for Montreal, under 50 to 113 basis points for Toronto, under 20 to 76 basis points for British Columbia (the province with the lowest borrowing costs at the time of writing), and under 30 to 85 basis points for Ontario. A basis point refers to 0.01 percent annual interest paid on a government bond.

14. They were North Bay (Moody's) and Vancouver (Standard and Poor's). The Vancouver downgrade was not because of the financial crisis, but because of the costs of the 2010 Winter Olympics.

15. These issuers were Belleville, Brandon, Brantford, Chatham-Kent, Essex County,

And yet municipalities pay significantly more, relative to Ottawa, than they did prior to the crisis. (Table 10.2 provides a complete list of municipal ratings as of 5 February 2014.) Creditworthiness also fails to account for co-movement in spreads. As Figure 10.3 reveals, the spreads of various subnational borrowers are highly correlated, despite significant differences and changes in their relative fiscal health.

Another explanation, and one more consistent with Figure 10.3, is volatility and uncertainty in global capital markets. Investors have a well-known tendency to rebalance their portfolios towards less risky and more liquid assets during periods of financial distress (Beber, Brandt, and Kavajecz 2009). Subnational bonds are inherently riskier than sovereign debt. They are also less liquid. It follows that their relative value declines when market conditions deteriorate. These phenomena—called "flight to liquidity" and "flight to quality," respectively—cause intergovernmental spreads to diverge (Lemmen 1999). Figure 10.3 reveals a close relationship between spreads and general financial stress. Spreads spiked, for example, during the height of the global financial crisis in 2008 and flared up during various stages of the Eurozone debt crisis.

If volatility is severe enough, subnational governments may lose access to credit. This is precisely what happened to provinces and municipalities for a brief period after the Lehman Brothers default in 2008 (Hanniman 2015b).

Volatility struck again in the summer of 2015 and from late 2015 to early 2016 when declining commodity prices and concerns about China's economy rattled global capital markets and undermined liquidity and confidence in subnational bond markets. The upshot was another round of spread widening and a series of two- to three-week periods in which provincial and municipal governments ceased to borrow. Newfoundland and Labrador went six months without borrowing on term markets.[16] As I will explain in future work, it is unclear whether subnational bond markets were ever strictly closed during this period (I was still investigating the nature and causes of the 2015–16 turbulence at the time of writing). Still, the volatility was nonetheless unnerving.

A recent commentary by Lovely (2016b) suggests yet another reason for the recent struggles of municipalities and provinces. He links recent increases in Ontario spreads to foreign selling of provincial debt, a consequence of the provincial sector's increasing dependence on foreign capital. This dependence would have translated into higher municipal spreads as well, as investors use yields on Ontario bonds to price municipal debt.

Guelph, Haldimand County, Halifax Regional Authority, Kingston, the Municipal Finance Authority of British Columbia, Oxford Country, Peterborough, Sault Ste. Marie, TransLink, Thunder Bay and Wellington County.

16. Term markets generally refer to bonds with maturities of five or more years. Newfoundland and Labrador relied on short-term paper (specifically, cash management bills) to finance its borrowing program during this time.

Table 10.2.1: Canadian Municipal Credit Ratings, 5 February 2014

Issuer	S&P	Moody's	DBRS
Barrie, City of	AA		
Belleville, City of	AA-		
Brampton, City of	AAA		
Brandon, City of	AA-		
Brantford, City of	AA+		
Calgary, City of	AA+		AA(high)
Chatham-Kent, Municipality of	A+		
Durham, Regional Municipality of	AAA	Aaa	
Edmonton, City of	AA+		AA(high)*
Essex, County of	AA		
Guelph, City of	AA+		
Halton, Regional Municipality of	AAA	Aaa	
Haldimand, County of	A+		
Halifax Regional Municipality	AA-*		
Hamilton, City of	AA		
Kingston, City of	AA		
Lambton, County of	A+		
Laval, City of	AA-		
London, City		Aaa	
Missisauga, City of	AAA		
Montreal, City of	A+	Aa2	A(high)
MFA-BC	AAA		
Muskoka, District Municipality of		Aa2	
Niagara, Regional Municipality of	AA		
Norfolk County	A		
North Bay, City of		Aa2	
Ottawa, City of	AA+	Aaa	
Oxford, County of	AA		
Peel, Regional Municipality	AAA	Aaa	
Peterborough, City of	AA-		

…continued

Table 10.2.2: Canadian Municipal Credit Ratings, 5 February 2014

Issuer	S&P	Moody's	DBRS
Quebec, City of		Aa2	
Regina, City of	AA+		
Saskatoon, City of	AAA		
Sault Ste Marie, City of	A+		
St John's, City of	A+		
Simcoe, County of	AA-		
Thunder Bay, City of	AA-		
Toronto, City of	AA	Aa1	AA
TransLink		Aa2	AA
Vancouver, City of	AA	Aaa	AA
Waterloo, Regional Municipality of		Aaa	
Wellington, County of	AA		
Windsor, City of	AA		
Winnipeg, City of	AA	Aa1	
Yellowknife		Aa2	
York, Regional Municipality of	AAA	Aaa	

*Rating withdrawn 2013. Municipal issuers upgraded at least once since 2008 (sixteen total): Belleville, Brandon, Brantford, Chatham-Kent, Essex County, Guelph, Haldimand County, Halifax Regional Authority, Kingston, MFA-BC, Oxford Country, Peterborough, Sault Ste Marie, Thunder Bay, TransLink, and Wellington County. Municipal issuers downgraded at least once since 2008 (two total): North Bay, Vancouver.
Source: Hanniman 2015b.

By the second quarter of 2016, volatility had subsided and provinces and municipalities regained unfettered access to credit markets. Subnational-federal spreads remained well above pre-crisis levels (perhaps because of lingering uncertainty in capital markets). But overall borrowing costs were extraordinarily low by historical standards.

Recent bouts with volatility are nonetheless unnerving. They reveal that subnational access cannot be taken for granted. They also reveal that access depends on factors beyond governments' control.

One possible solution is to substitute or supplement market borrowing with federal loans. This possibility was raised during the 2015 federal election campaign, when the Liberals proposed the creation of a Canada Infrastructure Bank. The bank would, according to the Liberal platform, allow the federal government to use its

triple-A credit rating to "make it easier and more affordable for municipalities to build … projects [for] their communities. Where a lack of capital represents a barrier to projects, the [bank] will provide loan guarantees and small capital contributions … to ensure that the projects are built" (Liberal Party of Canada 2015, 9).

This support, common in a number of countries, could lower borrowing costs and help insulate municipal borrowing from market volatility. But federal support is not without risks. It could distort local decisions and, by making it easier to borrow, undermine incentives to deliver projects efficiently.

Neither of these problems is inevitable. They depend on the bank's design. A bank could improve local decision making, according to Siemiatycki (2016), by leaving project planning and selection to municipalities while conditioning loans and other supports on rigorous planning and project assessment.

But even a light touch approach could steer investments away from local and towards federal priorities. Beyond this, a number of practical challenges remain. What role would the bank play relative to existing provincial agencies and bodies? Would it demand more stringent reporting and planning than these entities? And if so, why, in the absence of significant cost savings, would municipalities seek federal support?

In any event, it appears that the Liberals no longer envision the bank as a source of low-cost financing but rather see it as an arms-length mechanism for facilitating public-private partnerships with pension funds and institutional investors. Most of its efforts will focus, therefore, on executing large projects with lucrative revenue streams. Some cities will not use the bank because their projects are too small. Others may avoid it because they have no interest in charging user fees.

CONCLUSION

Canadian municipalities face significant infrastructure deficits. Several have been trying to fill that gap, in part, by borrowing. Is this strategy wise? My answer is a qualified yes. Borrowing provides an equitable and efficient means of financing long-term capital assets, and cities currently benefit from exceptionally low interest rates.

Granted, borrowing carries risks. Governments have to ensure they can repay their debts. They also need to ensure they have adequate revenues to operate and maintain new assets. Finally, they need to protect their finances from interest-rate shocks.

But municipalities are well positioned to manage these challenges. Their debts are a fraction of provincial liabilities, and provincial rules prohibit cities from borrowing to excess. Municipalities also issue fixed-interest-rate debt, only borrow to finance infrastructure investment, and assume virtually zero refinancing risk.

A spike in borrowing costs or loss of market access would therefore not trigger a repayments crisis.

Either could, however, undermine capital investment. At present, this is not a major risk. Interest rates are low and demand for long-term bonds is strong. But volatility in capital markets has increased significantly since 2008 and there have been periods when provinces and municipalities have had difficulty borrowing. These periods have been infrequent and, for the most part, short-lived, blips in an otherwise cheap and stable credit environment. But they remind us of the vulnerabilities that subnational borrowers face. They also raise the question of whether the federal government ought to borrow on municipalities' behalf. This would reduce borrowing costs and stabilize local credit, but at the risk of distorting local fiscal decisions. It is also unclear—given provincial dominance in this field—what role the federal government can feasibly play, but it is question worth exploring in today's volatile credit environment.

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11

RECYCLING PUBLIC ASSETS: AN IDEA WHOSE TIME HAS COME?

Michael Fenn

WHO WILL PAY FOR GROWTH AND INFRASTRUCTURE?

Although there is an emerging consensus in Canada on the need to invest in infrastructure for reasons ranging from economic stimulus to reducing the "infrastructure deficit," there is less agreement on the methods of funding and financing those investments. Despite successful campaign platforms arguing for deficit spending on infrastructure, public support for raising taxes and fees any time soon remains weak, even for much-needed public and community infrastructure.

Many influential opinion leaders and decision makers have made the case in very persuasive terms for revenues to support infrastructure spending and transit investment. While taxpayers are now evidently willing to accept short-term deficits to fund infrastructure investments, few successful politicians would claim that they are winning the hearts and minds of the voters for more money from taxpayers' pockets.

If we cannot generate new revenues from citizens and businesses to invest in public infrastructure assets, what can we do? The obvious answer, borrowing from Australia and Europe, is to look afresh at the valuable public assets that we already have. Faced with a range of fiscal and political challenges, many are proposing a new approach: "leveraging" or disposing of all or part of governments' investment in their legacy assets. The concept—known as "public asset recycling"—merits serious consideration.

PAYING FOR NEW INFRASTRUCTURE WITH ASSET DISPOSITIONS

"Recycling" public assets, including so-called government business enterprises (GBEs), aims to use vestigial public investments to fund current and future public infrastructure needs. Unlike traditional approaches, asset recycling does not look primarily to the overstretched taxpayer. It also offers the opportunity to provide greater returns to investments by public pension plans, like the Canada Pension Plan Investment Board or La Caisse de Dépôt et Placement du Québec.

There are obvious advantages to paying for infrastructure with asset dispositions rather than borrowing and using taxes to pay debt-service costs. For its part, the Ontario government annually pays over $10 billion in debt service costs.

How would such a fiscal policy work in Ontario? A 2014 report for the Mowat Centre at the University of Toronto, "Recycling Ontario's Assets: A New Framework for Managing Public Finances," maps out an approach (Fenn 2014a).

Given the current low interest and inflation rates and resulting high asset valuations, we may find that these public assets are worth more to the taxpayer in private hands. Could we sell some government enterprises and monopolies and still earn the same (or greater) net revenues to advance public policy goals? Our public-sector pension funds can certainly point out some good examples, although too often they are overseas investments by Canadian funds. Before the concept is dismissed because of special-interest advocacy, we should test the market seriously.

Canadian governments have been reluctant to embrace this funding and financing technique, despite the twin pressures of a poor fiscal outlook and increasing demands for infrastructure investment to sustain the economy and good quality public services. But we are not alone. As *The Economist* said in a 11 January 2015 issue, "Advanced countries have been slow to sell or make better use of their assets. They are missing a big opportunity" ("State-Owned Assets").

What incentive is there for public authorities even to consider the option of leveraging their wide array of public assets? The immediate answer appears to be: very little, unless the context and framework for decision making can be reformed.

Governments and the citizens they serve need to assess critically the billions of dollars in assets that we own as a society, from government enterprises to infrastructure—including public lands and buildings as well as valuable "intangible" data and technology assets—to see if it still makes sense to own them. If not, can we sell[1] them in whole or in part, perhaps including their monopolies, to pay for the infrastructure we need now for the long-term?

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1. For ease of reference, the term "sale" has been used throughout this paper. However, there are a range of asset disposition options, such as concessions, long-term leases and partial sale of equity, some of which are more politically and fiscally acceptable than outright sale.

THE PROMISE OF PUBLIC ASSET RECYCLING

Asset sale proceeds or avoided costs are fungible within public-sector budgets. By avoiding debt, deficits, and debt-service, asset sales would allow us to build and refurbish public infrastructure. This is not a case of selling the furniture to pay for the groceries, as some critics suggest. It is more akin to selling your used car to help pay for your new car, or selling the motorcycle of your youth to pay for your teenage daughter's dental braces. It is all a question of setting priorities.

In government, however, it is important to insist on fiscal and accounting discipline. Non-recurring revenues should be used to offset non-recurring expenditures. One-time sales of assets should be earmarked for capital purposes, for projects that would otherwise have been funded from taxpayer-supported debt or directly from taxation.

In this historically low-inflation and low-interest rate environment, the value of our public assets has likely never been greater, in current dollar terms. Across the world, pension funds and sovereign wealth funds are investing in infrastructure and in a range of public assets, from publicly operated business enterprises to information technology. Many of these capital investments provide "public goods" that would otherwise not be available to debt-ridden and cash-starved governments and public agencies. Other transactions are designed to produce one-time revenues or streams of revenues to build or restore public infrastructure, while reducing taxpayers' obligations to pay down deficits or to fund capital borrowing. As many have noted, this leads to the curious phenomenon of major Canadian public pension funds being world leaders in multi-billion dollar infrastructure investment but investing relatively little in Canada, with notable exceptions like Bruce Power or the proposed investment in Montreal regional transit.

RESISTANCE TO P3S

Historically, public entities in Ontario have preferred to be active participants in delivering services and building facilities rather than simply causing them to be provided to communities and consumers. In many cases, a government role was essential. Some capital projects were used as proof-of-concept expenditures, where the marketplace and the private sector feared to venture on its own, like the building of the Canadian Pacific Railway or rural electrification in Ontario. Until fairly recently, public-private partnerships—P3s or PPPs—had not attracted much support in Ontario, although recent history and conditions may be changing that.

Whether rooted in history, ideology, or self-interest, the arguments in favour of continued government involvement in community infrastructure should now regularly meet some basic tests. Would the public purpose not be achieved without government control and ownership? That may have been true at one

point, but is it still the case? What are the revenues flowing to government from government-owned operations? Could they be replicated or exceeded by private, taxpaying enterprises?

In Canada, much of the public infrastructure is owned and directly operated by local and regional governments or their agencies, as well as by the provinces and territories. When considering private-sector involvement in public infrastructure funding and financing, municipal leaders make the case that capital is inexpensive for the public sector in Ontario and readily available for public projects and public enterprises. However, the need to raise taxes and fees to fund public debt service frequently stands in the way of employing that decreasing marginal cost advantage.

The bottom line is that governments need to be smart about the use of an asset recycling process. As with other kinds of public-private partnerships, it is not a matter of ideology but more a matter of the structure and the terms of the deals. The experiences (both positive and negative) of other jurisdictions can guide Canadian governments, allowing problems and their effects to be anticipated and mitigated. Leveraging assets does not have to be a political minefield. It can be the route to governmental and fiscal success and can facilitate governments' ability to meet their current and future economic, fiscal, and programmatic objectives, without resorting automatically to the over-burdened taxpayer or adding to public debt or deficits.

Despite global trends, such initiatives have been uncommon and often unpopular across North America. While public entities in jurisdictions like Ontario have often preferred to be active participants in delivering services and building facilities rather than simply causing them to be provided to communities and consumers, those preferences need to be scrutinized under current fiscal and economic conditions. Some of this justification may be rooted in history; some is based on ideology or self-interest; some may claim a public purpose that is unlikely to be achieved without government control and ownership; and, some simply point to revenues flowing to government from government-owned operations. In the case of Ontario and its local government sector, all four of the foregoing arguments are heard.

WHAT'S THE RECORD?

A strong case can be made for public asset recycling, even with its relatively limited application in Ontario. The sale of the antiquated Ontario land-registry service Teranet has been a great (and ongoing) financial success for the Government of Ontario. Likewise, despite the financial risk profile of nuclear reactor operation and refurbishment, the multi-billion dollar P3 covering the Bruce Power nuclear facilities has helped Ontario to assure its electricity future, with relatively lower-cost and environmentally sustainable energy. Both asset dispositions earn solid returns for the 460,000 Ontario pension-fund members involved and their families. Other P3s can be found in Infrastructure Ontario's hospital expansion program, using its

Alternative Financing and Procurement (AFP) structure. Detractors can always find examples of failed or underperforming efforts involving the private sector in government assets, depending on one's definition of failure. Ventures like the 407 ETR toll road are often cited, although frequently ignoring the multi-billion dollar non-governmental infrastructure investment that it has generated. Successful asset recycling and P3s are ultimately a matter of their terms and conditions, results-oriented regulation, and of effective negotiations based on due diligence and learning from experience.

THE NEEDS ARE GREAT; THE OPPORTUNITIES ARE APPARENT

The need to leverage public assets is both pressing and opportune. By using yesterday's capital investments to fund today and tomorrow's public priorities, governments can dislodge themselves from the vice grip of a weak economy and crumbling infrastructure. They can move beyond the constraints of limited fiscal and political capacity to act in ways that are decisive, or even visionary.

The public asset recycling policy has been the centrepiece of recent Australian budgets. Australian Finance Minister Joe Hockey said in a speech prior to his 2014 budget statement:

> I also want to emphasise that the Government will not fall into the trap of cutting back on infrastructure spending as the United States and many European countries have been forced to do as their fiscal positions have deteriorated … Instead, the Government will boost infrastructure spending, including through my work with State and Territory counterparts on an asset recycling initiative … This groundbreaking policy will see the Commonwealth provide financial incentives to States and Territories that sell assets and recycle the proceeds of these sales into new productive infrastructure. (Hockey 2014)

Asset recycling in Australia combines an effort to fund needed infrastructure, provide investment opportunities for pension funds and domestic sources of capital, and reduce the debt and tax burdens of its state and municipal governments. In contrast to the situation in Canada, Australia's infrastructure-fuelled improvement in economic productivity obviously owes much to its ability to find the money to build and refurbish its infrastructure, in part from asset recycling.

"REYCLING" PUBLIC ASSETS

As the term "recycling" implies, the policy governing public assets should be dynamic and cyclical, not static or ideological. By levering existing public assets,

governments at all levels can unlock the wealth of those legacy assets, from land and infrastructure, to government enterprises and intangible assets like information technology. Recycled public assets can pay for urgently needed new public assets or replacement of deteriorating ones, from roads and bridges to educational facilities and environmental projects (Fenn 2014b).

Properly structured, for example by using Infrastructure Ontario's AFP model, the private sector finances, builds, and delivers new public assets on time, within scope, and on budget. It may also incorporate mandates to deliver services traditionally provided directly by public agencies.

When vestigial public assets are no longer required to achieve some policy goal or public priority, they can be returned to society as taxpaying enterprises and/or managed effectively and efficiently by private or non-profit sectors as facilities or services to meet community and consumer needs, often with the reassurance of public regulatory oversight.

The innovation and dynamism of the private sector can be harnessed to build and deliver new public assets or to provide services traditionally provided directly by public agencies. Even where public assets meet an express public policy goal or need, the non-government sector can play a role in efficient and customer-focused delivery (such as with Bruce Power nuclear energy) or to generate innovation and better financial returns to government (such as with the Teranet land-registry system).

Properly structured "asset recycling" can be used at each stage of an asset's lifecycle, from asset acquisition via P3s or concessions, to asset management by private operators, and on to full or partial sale, lease, or joint venture as part of government disposition of non-core public assets. In all three phases of their life cycle—from acquisition, through operation, to disposition—public assets can be leveraged to generate better performance, innovation, risk-transfer, and financial returns to governments and public agencies (including reduced express or implicit subsidies).

"THE DEVIL'S IN THE DETAILS": LESSONS FROM THE PAST

Done properly, the cycling of public assets through their three phases can reduce the burden on society by lowering public debt, tying infrastructure's use to its users over its lifespan, attracting new investment and economic activity, inducing creativity and innovation in construction and service-delivery, providing competitive returns for pension fund and public investments, and allowing today's needs and priorities to be met from legacy public assets.

While the concept of public asset recycling may sound deceptively simple, there are many hurdles to its effective implementation. But they are hurdles worth challenging, because the potential benefits are very significant.

In looking at the experience in Australia, Canada, and elsewhere, there are lessons to be learned. Success depends on creating conditions that favour government support for recycling assets and on matching those efforts with a clear-eyed approach to removing the barriers to private investment. Listed below are two partial checklists for success, largely based on the Australian experience.

WHAT ARE THE WINNING CONDITIONS FOR THE PUBLIC SECTOR?

In a world of social media and "gotcha" journalism, policy makers and decision makers within government are increasingly cautious and find it difficult to execute major public infrastructure ventures successfully. Cost overruns, long delays, and apparently uncontrolled expansions to project scope can make public infrastructure politically volatile and risky. The result is that many potential projects remain undeveloped, and caution guides those that are undertaken.

A number of obstacles must be cleared when proposing asset recycling policies and P3 infrastructure projects.

First, it is important to have a realistic estimate of the value and likely performance of public assets. Book value can understate the true value of an asset, especially in a low-interest rate, low-inflation environment. Valuing an asset on its current operations rather than its potential value in the hands of a well-financed, knowledgeable private operator can also lead to undervaluation. Selling an interest in an asset below its real value can result in the real value emerging over time, forcing governments to explain "leaving money on the table."

In some instances, the value of an asset can be materially enhanced prior to sale, or the asset can be coupled with operating conditions that make it more attractive. Such strategies might include simple refurbishment to eliminate deferred maintenance or environmental risks, or it could extend to retaining the government's service-monopoly, special tax treatment, reliable and favourable regulatory terms, one-time capital investments, or favourable labour-relations conditions.

It is equally important for estimates to be conservative, realistic, and if possible, evidence based. Too many projects—especially so-called greenfields projects—fail because of unwarranted optimism or enthusiasm about potential users, spin-off economic effects, and so on, that do not materialize or that are more vulnerable to pricing and economic conditions than anticipated.

Asset disposition is not a core competency of public service executives and policy advisors, and they can find themselves out-gunned by those who work in the field on a full-time basis. It is crucial to recognize that there will be some significant

transaction costs for a successful asset disposition program or P3 venture. These costs include engaging personnel that are best able to protect the government's position in transaction negotiations, while still retaining the project's attractiveness and potential profitability for the investor.

The private sector craves certainty and predictability, and it prices in the cost of risk and uncertainty. A program of public asset recycling based on a government-wide policy framework and a long-term time horizon encompassing multiple projects will reduce the risks perceived by the private sector.

Especially in Ontario, the public is inherently sceptical of P3s. A concept such as asset recycling needs to be carefully and candidly explained, its benefits clearly spelled out, and the proceeds earmarked for purposes that the public will support. Ideally, tying the sale of old assets to the near-term construction of new ones will reduce public concerns. Using asset sales for operating purposes, or even to pay down public debt, will have less support, and raise the spectre of "paying twice" for public services—once through taxes and then again through user fees or concession payments by government.

One of the most effective ways to ensure a tight connection between asset proceeds and dispositions is to establish a capital fund or trust for infrastructure and other capital assets. The public and auditors want guarantees against governments succumbing to other "fiscal temptations."

Risk-averse governments are inclined to respond to any public criticism of private operation of public infrastructure, often by imposing new regulatory conditions or intervening in day-to-day operations on behalf of political leadership. While these impulses are understandable in a democratic society, they can carry a high price. Private investors view government oversight as problematic, akin to the ability to change the rules of the game after the financial terms have been negotiated. It is essential that the right balance be struck between the need for political oversight and the risks and real costs of "political interference." An industry-focused, hands-off regulator is one of the best ways to balance protection of the public interest with the need for fidelity to agreed investor conditions and a healthy operating environment and market conditions.

To be successful, an asset recycling policy should begin with assets that will have a financial impact (i.e., significant disposition revenues for government) and important precedent-setting value, so that potential investors and the public will recognize the program as meaningful and a commitment. Governments need to avoid well-intentioned advice to start slow or small, often at the urging of interests that favour the retention of government monopolies and public employment.

Asset recycling is not just a fiscal policy; it is an economic policy. Governments should identify new public assets that will improve productivity, create new economic activity, and improve quality of life. They should use those same criteria in deciding which public assets to divest.

It is prudent to provide some form of regulatory oversight when divesting of a public asset, particularly in a monopoly or oligopoly service, or one with significant

regional implications. The focus of regulation should be on outcomes: specify the results you want to see, do not try to "regulate your way to success." Remember that increased levels and scope of regulation will be translated into lower asset valuations, fewer bidders, and, therefore, less competition, as well as less private-sector investment and innovation over time.

Public employees can make a material difference to the success of an asset recycling or P3 venture. In some cases, the poor state of public-sector labour relations, or resistance to modernization or changing economic conditions, may be unspoken motivations for greater private-sector involvement. In many more cases, public-sector employees are the key to the success of the change, as they have the greatest first-hand knowledge of the infrastructure's history and its current operations, as well as the clients it currently serves. Keeping public employees positive about a major change, such as by protecting employment or collective bargaining rights, can significantly influence the success of the early years of private-sector involvement.

In some cases, the problems we face with an asset-recycling program may be of our own making. Public-sector accounting, budgeting, accountability, and transparency rules need to support rather than impede achieving public objectives in changing circumstances. If they do not support those objectives, they should be modified to serve public policy goals and the public interest.

WINNING CONDITIONS FOR INVESTORS, PRIVATE AND NON-PROFIT PARTNERS

Asset recycling is not merely a strategy for meeting government needs, including protecting and advancing public interests. Any asset-recycling policy and program must also meet the needs of prospective private and non-profit sector partners, including their investors. The private partner must be persuaded to play a meaningful role, to invest capital, and to accept risk transfer.

What are those pre-conditions?

It is essential to give full weight to perennial private-sector concerns about "politics." Justified or not, the private sector has an elevated level of anxiety about the use of state power and government's ability (and periodic temptation) to change the rules of the game, as well as unease around bureaucratic processes.

It is also important to avoid "one-offs" with an asset disposition program. Making a clear commitment to a "pipeline" of public assets scheduled for disposition builds confidence and familiarity, which translate into better terms and lower cost for government.

Take measures to enhance certainty about government funding commitments over time. Relying on budgetary programming is insufficient unless it is bolstered by some sort of contractual obligation. The private sector is very conscious of

the potential for a future government to say it needs to make changes for fiscal or political reasons.

Recognize the expectations of investors, including pension funds, for reasonable, risk-adjusted returns. Fiscal impacts and policy goals are government's priorities. While they may support good public policy and top quality service delivery, investors' priorities are good returns and successful operations.

Pay particular attention to ensuring that projects are appropriately structured. Do not guess or presume that this is a core competency of public servants. Governments should get good advice, including having a "market sounding" performed by those who know how to evaluate the market and can be trusted to be candid.

Avoid complex, expensive, and inconsistent transaction processes. While infrastructure and P3 transactions are costly for taxpayers, they are proportionately much more expensive for potential counter-parties. If the costs appear too high in relation to the prospect of success, governments will receive fewer, more expensive bidders and partners. Investors—both domestic and international—should get used to the government's way of doing business so they can reduce their transaction costs and avoid pricing in uncertainty costs. It is also important to ensure that both sides win. Legal protections should be sound but reasonable, with an eye to enabling the success of the venture. The opportunity for shared benefits should be recognized, and incentives for success should be both encouraged and mutually beneficial.

As noted above, ensure that the government has specialist expertise and promotes processes that attract counter-party expertise in more than simply deal making. The best transactions are those in which experienced, knowledgeable experts understand all the risks, all the terms, and all the implications. Evaluations of the value of the asset and the transaction should receive the same analysis, with an eye to the value of the asset in private hands, and with a cold-eyed estimate of the potential use, unanticipated costs, or revenue-generating potential of an asset.

Recognize that greenfield projects without a demonstrable track record have special risks for investors and private operators. If the government does need to do greenfields projects, it should be ready to absorb discounts or provide guarantees. However, governments should not neglect the ability to demand protection on the "up" side, not just the "down" side. It may be easier to negotiate a share of an unanticipated gain in future years, much as the Ontario government did with the Teranet transaction—and conspicuously failed to do with 407 ETR.

Dealings with the private sector need to reflect the environment within which the private sector operates. Recognize and understand private-sector perspectives on regulatory, liquidity, and industry pressures, including the ways in which tax, accountability, and accounting regimes work on the private-sector side of a transaction. In particular, the government side needs to monitor closely and respond to changes in the investment climate and conditions facing both potential and existing private and non-profit partners.

Respect the role, contributions, and impact of public-sector trade unions. Labour relations considerations will be prominent in the minds of potential private-sector and non-profit sector bidders and partners.

CONCLUSIONS

"Recycling" public assets—especially government business enterprises—offers an opportunity to use past and vestigial public investments to fund current and future public needs and infrastructure priorities. It makes it possible with fewer demands placed upon overstretched taxpayers and with greater returns to pension plans and other domestic investors. Public asset recycling is a timely fiscal policy idea for Canada and its governments.

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FISCAL POLICY AND FEDERAL INFRASTRUCTURE FINANCING

C. Scott Clark[1]

"POLITICAL WISDOM" TURNED UPSIDE DOWN IN OCTOBER 2015 ELECTION

A great many things changed with the election of the Liberal government in October 2015. But perhaps one of the most important changes was a new approach to fiscal policy. During the election campaign, the Liberal Party committed to running "modest" deficits for three years in order to finance an infrastructure strategy aimed at promoting long-term economic growth. The party also adopted a stable debt-to-GDP ratio as its medium-term fiscal anchor.

This fundamental change in direction constituted a major political risk for the Liberal Party. For the past decade, the previous Conservative government had told Canadians repeatedly that running a deficit would be a disaster and would quickly "turn Canada into Greece." Canadians were told they would risk losing everything if the federal government did not balance the budget. According to the generally accepted political wisdom during that time, any party willing to "promote" higher spending and/or lower taxes that would result in a deficit and higher debt would

1. This paper is based on numerous articles that my colleague Peter DeVries and I have written over the past several years on our blog 3DPolicy.ca. Some of these articles have appeared in various forums such as the *Globe and Mail*, the *Toronto Star*, and the i-Politics news site. The paper was originally presented at the Infrastructure Conference at Queen's University in June 2015, well before the October election. I have taken the opportunity to update the presentation in light of the October 2015 election results and the March 2016 budget.

be trounced in an election. This so-called political wisdom came crashing down on 19 October.

WHY HAD CANADIANS COME TO FEAR DEFICITS AND DEBT?

Canadians' fear of deficits and debt was in part probably the result of the 2008–09 global economic and financial meltdown and its impacts on the global economy and on government budget balances, particularly in the Euro-area countries. Economic and financial crises create uncertainty, and uncertainty inevitably breeds fear. During the 2015 election, the Conservative Party, and surprisingly even the New Democratic Party, argued that with a steadily worsening global economy, this was not the time to change the course of fiscal policy. Notwithstanding that the economy had been operating below potential since 2008, the Conservatives under Prime Minister Stephen Harper argued that fiscal policy should be committed to balanced budgets and not to supporting aggregate economic demand.

In part, Canadians' anxiety around debt was probably also the result of a desire to avoid high government spending, rising deficits, and the resulting build-up of debt that occurred during the 1980s and eventually led to the tough austerity budget introduced by the Liberal government to resolve the 1995 fiscal crisis. Canadians were told that the only way to prevent a similar fiscal crisis from happening again was to maintain balanced budgets. The Conservatives went so far as to introduce legislation in their last budget that committed the government to a balanced budget.

Why was the Conservative government so hung up on a balanced budget? In the EU, the "acceptable" deficit target is 3 percent of GDP, and the "acceptable" debt-to-GDP target is 60 percent of GDP, and even these targets are regularly breached. The original deficit target in the Liberals' 1995 "austerity" budget was also 3 percent of GDP.

In today's terms, a 3 percent deficit target would amount to a deficit of about $60 billion dollars. It just happened that Canada's deficit was largely eliminated because of an unexpectedly strong global recovery, expenditure restraint, and structural reforms implemented in the 1980s and early 1990s. This was never part of the original plan.

In his first budget, Liberal Finance Minister Morneau repealed the Conservative balanced budget legislation.

WHY DID CANADIANS FINALLY REJECT FISCAL AUSTERITY?

By the time of the 2015 Canadian election, it had become obvious that fiscal austerity was failing miserably, not just in Canada but also everywhere else where it was being applied. Fiscal austerity was not leading to increased economic growth and jobs.

Since 2008, the EU and the Euro area have been unable to escape repeated recessions. Economic growth has been virtually non-existent. Repeated applications of fiscal austerity in Greece, Portugal, Spain, and Italy led to falling economic growth and to a worsening fiscal situation. Unemployment rates in Greece rose above 20 percent and in the case of young people above 50 percent.

In Canada, economic growth failed to recover to its potential despite ten years of fiscal restraint. Labour force participation and employment rates remained below their 2008 levels. The unemployment rate remained above 7 percent over most of this period. It was becoming clear to most Canadians that an overly austere fiscal policy based entirely on balancing the budget was doing nothing to promote economic growth and job creation.

Only the United States had experienced an economic recovery, and it was the one advanced economy that had rejected the adoption of austerity budgets.

AUSTERITY VERSUS DEFICITS: THAT IS THE QUESTION

Despite the failure of fiscal austerity and balanced budget commitments, many people still argued during the 2015 election that deficits "don't promote economic growth" (Crowley 2015a) and "stimulus proponents disregard dangers of deficits at their peril" (Crowley 2015b). The case has been made that Paul Martin's 1995 austerity "budget" *on its own* actually led to the subsequent recovery in economic growth in Canada and the resulting seven years of budget surpluses.

Most economists agree that Martin had no choice but to implement an austerity budget in 1995, involving an unprecedented reduction in program spending. By the early 1990s, Canada's debt-to-GDP ratio was approaching 70 percent, the second highest among the G7 countries. The government faced a fiscal crisis and a credibility crisis. The 1995 budget was partially responsible for eliminating both crises. But a lot more was needed to make fiscal consolidation a successful solution to the problem.

Contrary to the austerity proponents, the mid-1990s was one of those very rare periods where a number of positive factors came together to help resolve the 1995 "fiscal crisis" and create strong economic growth: expenditure restraint, partial de-indexation of the tax system, and reforms of the personal, corporate, and sales-tax systems introduced by the previous Conservative government; the North American Free Trade Agreement; the setting of the inflation-reduction target in the

late 1980s; the resulting rapid reduction in short-term real interest rates (i.e., an easing of monetary policy) prior to 1995; the reduction in long-term interest rates (after 1995) as a result of lower inflation expectations, and lower risk premiums; and finally, and probably most importantly, the strong recovery in the global economy, particularly in the United States and China.

To argue that fiscal austerity alone created the economic and fiscal turnaround in the second half of the 1990s is without merit. Without the reinforcing factors, the 1995 austerity program would definitely have produced a massive slowdown in the economy. The austerity policy imposed in the Euro area in recent years demonstrates this, and even the IMF now understands that it is not possible to solve a debt problem without economic growth.

It is not surprising that those who promote the view that austerity promotes growth also believe that deficits don't promote economic growth. Most observers believe, however, that the temporary stimulus applied by the G20 did help to mitigate the decline in global GDP in 2009–10. Growth recovered strongly in Canada in 2010 as a result. But with the beginning of restraint in the 2010 budget, growth fell off steadily in subsequent years, and the economy has been operating below potential ever since.

AGGREGATE DEMAND MATTERS AND SO DOES FISCAL POLICY

Normally after a recession, output will recover back to its potential. But this has not happened in most OECD countries since the 2008–09 global recession. Instead, OECD economies have continued to operate below their potential. The result has been inadequate levels of investment, low employment rates, high levels of long-term unemployment, low participation rates, high youth unemployment, and a less employable labour force. The net result has been a reduction in both actual and potential output. There is growing evidence that the level of potential GDP has declined in many OECD economies (including Canada) since 2010, compared to projections of potential output made in 2007.

The reality is that aggregate demand matters, and for the last decade there has simply not been enough demand in the global economy. For years, monetary policy has been the "work horse" in most advanced countries to support economic growth. But monetary policy has become exhausted and there is little more it can do. It is now up to fiscal policy to take over to promote economic growth.

The IMF is now recommending that governments with sustainable fiscal positions (like Canada, with a debt-to-GDP ratio around 30 percent and falling) should undertake expansionary fiscal policy by increasing infrastructure investments to strengthen short-term aggregate demand and long-term potential output. This was also a commitment made by the G20 in 2014 ("Group of Twenty IMF Note") and

repeated each year since. Unfortunately, there has been little follow-up among G20 countries on this commitment.

STRENGTHENING ECONOMIC GROWTH THROUGH INFRASTRUCTURE SPENDING

Canadians know that much of the infrastructure in Canada needs to be improved or replaced. Transportation systems, public utility systems, education infrastructure, healthcare infrastructure, and senior care infrastructure are only some of the areas where more infrastructure investments are needed.

In other words, Canadians want better highways and subways, better education and healthcare, but until recently they were uncertain about how to pay for them. Should the government run deficits and leave more debt for future generations? Or should taxes be raised and/or other spending cut?

To answer this question, it is important to understand that spending by governments on public infrastructure that would provide services to Canadians for many decades in the future is not the same as spending by governments on programs and services that only benefit current generations. Public spending on "current consumption" should be paid for by the generations doing the consuming. In contrast, however, spending on public infrastructure has an economic life that usually lasts twenty, thirty, or fifty years, if not longer. There is no reason why some of these investment costs should not be financed by the future generations who will also be benefiting from such spending.

Moreover, much of this infrastructure spending may actually pay for itself. A new efficient highway system, for example, would increase productivity for trucking companies and possibly earn them a return of 5 percent. This higher income could be taxed at, for example, 40 percent. These days the government can issue thirty- to fifty-year bonds at less than 2 percent. In other words, the investment in the highway by the government would pay for itself through higher productivity and higher tax revenue. The same is true for more efficient transportation systems. This was an observation made by the IMF in 2014 when it recommended that the G20 commit to a coordinated infrastructure strategy to strengthen global economic growth (ibid.).

Accounting policies currently followed by federal and provincial governments already recognize this special nature of infrastructure spending. In federal and provincial budgets, infrastructure spending is amortized over its service life rather than recognized and expensed when it is put in place. "Current consumption," on the other hand, is fully charged to budget spending immediately.

This means, for example, that if the federal government were to repair the Champlain Bridge for $5 billion (which could be borrowed in financial markets in the first year of work), there would be no charge to the federal government spending

in the federal budget until the bridge is repaired and vehicles are operating on it. At that point, assuming the bridge lasts fifty years, the government would charge the federal budget $100 million a year for fifty years. The only thing that would appear in the budget immediately is the interest payments on the fifty-year bonds. The actual borrowing in the bond market would show up below the budget line, under the heading of "financial requirements."

So why, until the last election, were all political parties so against borrowing money at historically low interest rates to pay for needed infrastructure spending that might pay for itself through higher productivity and earned income, possibly without any cost to the taxpayer?

CHOOSING A FISCAL ANCHOR

In his first budget, Liberal Finance Minister Morneau revealed that the deficit would substantially exceed $10 billion and that it would not be eliminated over the next four years. Deficit elimination was no longer a fiscal anchor. Instead it became a "long-term" fiscal issue.

If a balanced budget is not the right policy anchor in these circumstances, then what is? The finance minister still remains committed to implementing a medium-term fiscal policy that will maintain a stable or declining debt-to-GDP ratio. That is his fiscal anchor. Currently the federal debt is around 31 percent of GDP, slightly higher than in 2008–09 before the financial crisis and not much higher than it was over thirty years ago.

Few people appear to understand what this means for budget deficits. In order to maintain the minister's commitment to a stable or declining debt ratio over the next four years, the growth of the debt must not exceed the growth in the economy. This implies the budget deficit may continue to increase without violating the minister's commitment. Based on the Liberal budget, it means that the deficit must be no higher than $22 billion in 2016–17, rising to around $30 billion over the next four years (about 1.5 percent of GDP). Higher deficits would result in the debt growing faster than the economy and a rising debt burden as measured by the debt-to-GDP ratio.

Adopting a "stable" debt-to-GDP ratio as a medium-term fiscal anchor gives the government more needed flexibility in implementing its policy agenda, but there is still an upward bound that cannot be broken if fiscal and indeed political credibility are to be maintained. A deficit between 1.5 and 2 percent ($40 billion) of GDP would violate the government's commitment to a stable debt burden at its existing level of 31 percent.

However, there are no economic reasons why a "stable" debt burden around 31 percent is better than a "stable" debt burden around 35 percent or even 40 percent. Similarly, there are no economic reasons to justify a lower debt ratio of 25 percent (the original Conservative goal). The experience of other counties also provides no

help in determining an "acceptable" debt level for Canada. For example, consider total government debt burdens (using 2015 IMF Statistics and expressing debt as a percentage of GDP) of the G7 countries: United States (79.9 percent), Japan (126.0 percent), United Kingdom (80.3 percent), Germany (48.4 percent), France (89.4 percent), and Italy (113.5 percent).

Among other countries, debt burdens are: Australia (17.5 percent), New Zealand (8.8 percent), Norway (–161.7 percent), Sweden (–18.4 percent), Denmark (6.3 percent), and Netherlands (34.8 percent). Countries with small open economies have debt ratios much lower than those in the G7.

Euro countries are required to follow policies that would "eventually" lead to a deficit not exceeding 3 percent of GDP and net debt no greater than 60 percent of GDP. Few EURO countries have ever achieved these goals, and few are likely to achieve them in the future. Some countries (Japan and Italy) do not care about their debt levels because their government debt is mostly held internally, and the United States does not care about its debt level because the country is so large and important it does not need to care.

A key question for policy makers is whether there is a level of debt beyond which growth will suffer. An important study by Rogoff and Rheinhart (2010) came to the conclusion that when debt levels reached 90 percent of GDP, growth indeed would suffer. The conclusions of their research, however, have been heavily criticized (Pescatori, Sandri, and Simon 2014).

In contrast, in Canada's case there was a significant interest rate premium placed on its debt in the late 1980s and early 1990s, when its debt ratio approached 70 percent. However, the fiscal situation then was totally different than it is today. Nevertheless, the exact relationship between growth and debt remains an open issue for economists and of little use to policy makers.

Targeting a debt level for Canada averaging around 31 percent of GDP (roughly where it is now) over the next four years would be consistent with running a structural deficit of up to $30 billion, or just under 1.5 percent of GDP. The budget situation is close to this limit already.

RESPONSIBILITY FOR INFRASTRUCTURE SPENDING

The federal government has the fiscal structure and fiscal capacity to fund new infrastructure spending. However, the provinces, territories, and municipalities control over 95 percent of Canada's core infrastructure. This means that the federal government must find a way to provide financial assistance to the provinces, territories, and municipalities to finance their infrastructure.

The federal government already allocates significant amounts of funding to the provinces, territories, and municipalities for infrastructure through its New Building Canada Plan, with spending spread over ten years. These amounts directly affect the federal government's budgetary balance, as it has no ongoing liability with

respect to any of the projects financed through this plan. One option would be for the federal government to replace this funding with a new much larger "federal-provincial infrastructure transfer program" spread out over a longer time frame.

The federal government also provides $2 billion annually through the Gas Tax Fund (GTF) to provinces and territories, which in turn flow this funding to their municipalities to support local infrastructure priorities.

My colleague Peter DeVries and I (2015) proposed an additional financing vehicle. We proposed that the federal government assist the provinces, territories, and municipalities in the financing of their infrastructure priorities by providing low-cost financing. The federal government's fiscal structure is sustainable, whereas that of the other jurisdictions is not. The federal government can borrow at a much lower interest rate than the provinces, territories, and municipalities, given its strong credit position. It could then pass these savings on through the establishment of a federal Crown Infrastructure Corporation modelled along the lines of the Export Development Corporation.

The federal government would borrow long-term debt at today's historically low interest rates on behalf of the Infrastructure Crown Corporation. The federal government already borrows on behalf of the Business Development Bank of Canada, Farm Credit Canada, and Canada Mortgage and Housing Corporation. Provinces and territories could then borrow for specific infrastructure projects from this Infrastructure Crown Corporation at rates below what they would pay. As long as the Infrastructure Crown Corporation recoups its borrowing and administrative costs, there would be no incremental impact on the federal government's budgetary balance.

The Liberal Party adopted this proposal in its election platform and made a commitment in the budget to provide subsidized financing. Consideration is also being given to finding whether and how to involve private-sector lenders in the financing of public infrastructure.

FACING A FISCAL STRAIGHTJACKET

The new Liberal government has made a major change in the way fiscal policy will be applied in the future. Fiscal policy will no longer be focused on deficit elimination but will be used to promote economic growth and job creation subject to maintaining a sustainable fiscal structure. This policy will allow the government to run structural deficits in order to finance an expanded infrastructure strategy, provided that a stable debt-to-GDP ratio is maintained. Given global economic prospects and uncertainty, a greater focus on using fiscal policy to support domestic economic demand is the right policy decision.

The government has adopted a fiscal anchor of maintaining a stable medium-term debt-to-GDP ratio of around 31 percent. Achieving and maintaining this target will present a constant challenge for the government in future budgets. The projections

released with the March 2016 budget showed that, allowing for economic prudence, there was no room for new unfunded policy initiatives, even though much of the Liberal election platform had yet to be implemented.

Fiscal credibility is hard to earn and very easy to lose. Once lost, it is hard to regain. The government has dropped its fiscal anchor and will have to live by it. This means that new government spending that benefits only current generations must be paid for by higher taxes and/or cuts in current programs.

At the same time, the growth of borrowing is constrained so as not to exceed the growth of GDP in order to maintain the fiscal anchor of around 31 percent. Given the size of the government's election platform, the government is now faced with the major challenge of deciding what its policy priorities really are.

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13

Kenneth MacGregor Lecture

WHEN PUBLIC-PRIVATE PARTNERSHIPS MAKE SENSE: TWO BASIC OBSERVATIONS

José A. Gómez-Ibáñez[1]

It is a great honour and a pleasure to give the Kenneth MacGregor Lecture at Queen's University. It seems appropriate that infrastructure is the topic of this year's conference on the state of the Canadian Federation, since infrastructure is typically a shared responsibility of national, provincial, and municipal governments. Moreover there has been a growing concern in many industrializing and developed countries that investments in infrastructure may be insufficient to support desired levels of safety and economic growth. Over the last three decades, this concern has led many countries to experiment with providing infrastructure through public-private partnerships, often abbreviated as P3s.

In this lecture I will draw primarily on the experience with P3s in highways in North America to argue that partnerships, although still something of a novelty, hold great potential for improving the delivery of infrastructure services but with two important caveats. First, the partnerships must be designed primarily as a means of increasing real efficiency in the delivery of infrastructure services and not simply as vehicles for accessing private capital markets or alleviating immediate government budget problems. Second, more care must be taken in drafting the contracts between the public and private partners to reduce the risk that the terms

1. The author would like to thank Andrew Deye for his advice and research assistance on the most significant highway public-private partnerships in North America.

eventually prove so unworkable for one or both parties that they lead to potentially controversial renegotiations.

PUBLIC-PRIVATE PARTNERSHIPS DEFINED

First let me start by defining what I mean by public-private partnerships in infrastructure. While there is no universally accepted definition, partnerships typically differ from traditional procurement in several ways. One of the most important is that they bundle together, in a single contract, activities that are traditionally procured separately. Thus a P3 may call for the private provider not just to design or build a highway but to finance, operate, and maintain it for several decades as well. This bundling increases the accountability of the private partner to the government, since it reduces the possibilities of one contractor blaming others, should something go wrong. And bundling motivates the private partner to take a longer-term, whole-life perspective in designing, building, and maintaining the facility, which can be important with costly and durable infrastructure.

Another difference with traditional procurement is that the contracts sometimes specify the services desired rather than the asset required. Thus, for example, a contract may call for a highway capable of safely carrying a specified quantity of traffic in the peak hours and direction at a minimum average speed rather than a highway with a specified alignment, number of lanes, minimum lane and shoulder widths, maximum grades, etc. The focus on services rather than assets gives the private partner leeway to investigate more cost-effective methods of providing the same services.

Finally, P3s generally require the private partners to assume more risk than they would under traditional provision. Much of the added risk is a consequence of the bundling of activities and the focus on services rather than assets. With bundling, the private partner essentially assumes the risk that the different components will work together as planned, and by specifying services, the private partner assumes the risk that the asset built can deliver the services promised.

PARTNERSHIPS IN NORTH AMERICAN HIGHWAYS

I use partnerships in high-performance highways in North America to illustrate these issues in large part because highways are among the most popular forms of P3 in many countries. Modern highway P3s date back to the 1980s in the United States and Mexico and a few years later in Canada. Only a small fraction of highway investments are made through P3s, with the exception of Mexico between 1989 and 1994. But P3s remain more common in highways than in other infrastructure sectors. By one rough calculation, highways accounted for roughly two-thirds by

value of the P3s that reached financial close in the past decade in both the United States and Canada.[2]

The popularity of P3s in highways means that there are many well-documented projects using a variety of different approaches. This talk is based primarily on a review of twenty-five significant highway P3 projects that reached financial close in the twenty-five years between 1989 and 2014. The criteria for inclusion were partly the value of the project but also a subjective assessment of its influence on the design of subsequent projects. Indeed, one of the projects on the list (the lease of the Pennsylvania Turnpike) was withdrawn before financial close but is included nonetheless because it was so influential. And Mexico's toll road program from 1989 to 1994 is listed as if it were a single project even though it consisted of fifty-two separate concessions.

As shown in the table, many of the earlier projects involve greenfield concessions to build a new highway and operate it for twenty or more years, for example, while some later projects are brownfield leases of existing highways often with the obligation to make some improvements during the life of the lease. In many early cases, the concessionaire or lessee assumes the revenue risk in that it is expected to recover its costs with the tolls collected from the highway users, while in other later cases the government assumes the revenue risk and makes payments to the concessionaire that are based on the days and hours the road is available to users rather than the tolls that users pay. The duration of the concessions or leases varies as well, with some in Mexico as short as a few years and others as long as ninety-nine.

The United States

The United States began to explore private toll roads in the mid and late 1980s, about the same time as Mexico and a little before Canada. The US experience has been shaped importantly by the country's 1956 decision to impose a federal tax on gasoline to finance a 41,000 mile Interstate and Defense Highway System. A number of eastern states had built high-performance highways financed by tolls starting in the 1930s, but federal legislators thought it would be difficult to fund

2. In a list of thirty-two infrastructure P3s with a total value of $23.7 billion that closed in Canada between 2005 and 2015, for example, nineteen were highways with a value of $15 billion. In a similar list for the United States, twenty-five of forty-nine projects, with a value of $47.6 billion out of $61.2 billion, were highways, while the second and third most popular types were parking (eight) and water and sewage utilities (six). Mexico was a pioneer in private toll highways, awarding concessions for thousands of kilometres between 1989 and the Mexican financial crisis of 1995, and more recently in 2007 received $4 billion for leasing a package of four major toll roads totalling 590 kilometres that it had taken over in the aftermath of the 1995 crisis.

Table 13.1.1: 25 Significant Highway PPPs

Project	State	Financial close	Open to traffic	Value ($ million)	Miles	Years	Avail. or toll	Status
Mexico toll road program	Mex	1989–1994	1991–		5,200 km	Vary	Toll	Government has taken back 23 of 52 concessions
SR 91 Express Lanes, Orange County	CA		1995	$135	10	35	Toll	Profitable; government buys back for $207 million in 2003
Dulles Greenway	VA		1995	$350	14		Toll	Restructured in 1999 and 2004
407 ETR Toronto	ON	1999	lease	C$3,100	108 km	99	Toll	Highly profitable and controversial
SR 125 San Diego	CA	2003	2007	$847	10	35	Toll	Bankrupt in 2010 (first TIFIA default); government buys back for $341 million in 2011
Chicago Skyway	IL	2005	lease	$1,800	8	99	Toll	In difficulty
Golden Ears Bridge	BC	2006	2009	C$1,000	9	35.5	Avail.	Satisfactory
Indiana Toll Road	IN	2006	lease	$3,800	157	75	Toll	Bankrupt in 2014
FARAC I (Mexico)	Mex	2007	lease	$4,000	590 km	30	Toll	Satisfactory
Northwest Parkway	CO	2007	lease	$603		99	Toll	In difficulty?
I 495 Express Lanes	FL	2007	2012	$1,900	10	75	Toll	Restructured in 2014
SH 130	TX	2008	2012	$1,400	41	50	Toll	Being restructured
East End Crossing	IN	2012	2016	$763	4.4?	35	Avail.	
Goethals Bridge	NYNJ	2013	(2018)	$1,500	1.5	40	Toll	

…continued

Table 13.1.2: 25 Significant Highway PPPs, continued

Project	State	Financial close	Open to traffic	Value ($ million)	Miles	Years	Avail. or toll	Status
Pennsylvania Turnpike	PA	2008	lease	$12,800	498	75	Toll	Withdrawn before close
I 595 Express Lanes	FL	2009	2014	$1,900	10.5	35	Avail.	
Port of Miami Tunnel	FL	2009	2014	$903	1	30	Avail.	Satisfactory
North Tarrant Express	TX	2009	2014	$2,000	13	52	Toll	
LBJ Managed Lanes	TX	2010	2013/15	$2,700				Opening in phases
Simon Fraser Perimeter Road, Vancouver	BC	2010	2013	C$660	40 km		Avail	Satisfactory
Presidio Parkway, SF	CA	2010		$929	1.5	33	Avail.	
PR-22/PR-5	PR	2011	lease	$1,400	52	40	Toll	
I 95 Express Lanes	VA	2012	2014	$925	29	73	Toll	Open December 2014
Edmonton Ring Road	AB	2012		C$1,800	27	34		
Elizabeth River Cross.	VA	2012	2016	$2,000		58	Toll	
East End Crossing	IN	2012	2016	$763	4.4?	35	Avail.	
Goethals Bridge	NYNJ	2013	(2018)	$1,500	1.5	40	Toll	

Source: Prepared by José A. Gómez-Ibáñez, with the assistance of Andrew Deye.

a transcontinental network with tolls, given the sparse traffic across the western plains. The states would build and operate the Interstate System segments in their territories and be reimbursed for 90 percent of the construction cost, but in return they were prohibited from collecting tolls on those segments. The restriction on tolling Interstate highways encouraged early proponents of private toll highways to search for greenfield routes that had enough traffic to be toll-funded but had been overlooked by the planners of the Interstate System.

This search for profitable greenfield projects was not very successful. Of the five major highway P3s proposed in the 1980s, two were eventually abandoned in the face of investor scepticism and two were built only after many years of delay and even then went bankrupt because of insufficient traffic.[3] The only project that was a financial success involved building ten miles of "express lanes" in the median of the highly congested State Route (SR) 91 in Orange and Riverside Counties in California. The SR-91 express lanes offered motorists a faster alternative to the existing general traffic lanes that they could use if they were willing to pay a toll or to travel in a car with three or more occupants. SR 91 pioneered the concept of express lanes, which might be regarded as more brownfield than greenfield in that the lanes are typically built within the right-of-way of an existing highway. They are highly risky nonetheless because they can make money only a few hours of the day, when the regular lanes are congested. Moreover, there is often some uncertainty about how much motorists will pay for a faster trip.

The experiences of these early projects focused investor interest on two types of P3s in the decades that followed. The first were express lanes similar to SR-91 but in more difficult and complex situations that often required rebuilding the general traffic lanes. While SR-91's lanes had been built for $135 million, these projects, two each in Florida, Texas, and Virginia, had construction costs in the range of $1 to $2 billion each. At least two of these express lane projects originated as unsolicited proposals from private consortiums headed by construction contractors.[4]

The second type of P3 of interest was a brownfield lease of one of the toll roads that had been built before the Interstate System or without Interstate funding, and thus were not subject to the ban on tolling Interstate highways. These proposals came to be known as asset monetization or asset-recycling projects because they involved leasing the road and the right to collect tolls on it in return for an upfront

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3. The five include the Dulles Greenway that began as an unsolicited proposal to the Commonwealth of Virginia in 1985 and four proposals that won a competition held by the State of California in 1989 for highway projects to demonstrate the effectiveness of private participation. Only the Greenway and two of the California projects (SR 91 Express Lanes and SH 125) were ever built. For a description of these projects, see José A. Gómez-Ibanez and John R. Meyer, *Going Private: The International Experience with Transport Privatization* (Washington, DC: Brookings Institution, 1993), 172–73.

4. The 495 express lanes and the I-95 express lanes in Virginia.

payment that could be used for other purposes. More than a half dozen asset-recycling leases would eventually be awarded, many for as long as seventy-five to ninety-nine years and for upfront payments in excess of $1 billion. The most famous was a proposed seventy-five-year lease for the 537-mile Pennsylvania Turnpike which, when tendered, generated an astounding bid of $12.8 billion; the bid was withdrawn in 2008 with the onset of the global financial crisis. These asset-recycling projects were typically advanced by mayors or governors facing budget crises, including Chicago Mayor Richard Daly, Indiana Governor Mitch Daniels, and Pennsylvania Governor Ed Rendell.

During this period the federal government began to offer financial support and technical assistance to highway P3s. In 1998 Congress passed the Transportation Infrastructure Finance and Innovation Act (TIFIA) that authorized the US Department of Transportation to make direct loans or issue loan guarantees on generous terms to qualified surface transportation P3s. And in 2012 Congress greatly increased the funding for TIFIA loans and guarantees and allowed them to finance up to 49 percent of a project's construction costs. Congress also gave the US Department of Transportation the power to allow states to issue up to $15 billion in "private activity bonds" on behalf of private infrastructure providers. These bonds bore lower interest rates because the interest they paid was exempt from federal income taxation. Congress also clarified that states could toll new traffic lanes on the Interstate System as long as the number of untolled lanes was not reduced.

Canada

I hesitate to draw too heavily on the Canadian experience in this forum, since I am sure many in the audience are better informed than I am. But Canada cannot be ignored, since it has developed one of the best P3 programs in the world.

My understanding is that Canada began experimenting with highway P3s in 1993 when the federal government awarded a concession to build and maintain the Confederation Bridge, a 12.8 kilometre, Cdn$739 million span connecting Prince Edward Island and the mainland.[5] The provinces soon eclipsed the federal government in P3 activity, including Ontario which in 1999 awarded a ninety-nine-year concession to widen, extend, and maintain the 108-kilometre Highway 407-Electronic Toll Road on northern edge of Toronto in return for an upfront payment to the project of Cdn$3.1 billion. The province used the proceeds from the lease to retire the nearly Cdn$1 billion in debt it had incurred in building the

5. For a brief if slightly dated overview of the Canadian P3 programs in infrastructure, see Infrastructure Investor, "Canada: An Intelligence Report," December/January 2010/11, www.infrastructureinvestor.com.

first forty-one kilometres of the road, and it deposited the excess in the Ontario's general fund.

The 407 project became highly controversial in part because the contract gave the concessionaire substantial latitude to raise toll rates without public review. The combination of high toll rates and higher-than-expected traffic growth led to high profits and calculations that the concessionaire may have paid only half the value of the concession.[6]

Highway 407 was arguably the first asset-recycling P3 in North America, and it may have influenced the debut of recycling in the United States a few years later. But in Canada the controversy over 407-ETR sparked a sensitivity to the need to incorporate public interests in toll setting, including the option of compensating the concessionaire with availability payments so that the government enjoyed the discretion but also bore the financial consequences of setting tolls. In most of the subsequent major Canadian highway P3s the concessionaire received availability payments from the government while the government retained the toll receipts.

The 407 experience also may have contributed to the decision by many provinces to establish special procurement agencies to promote and oversee the award of P3 contracts, including guidance on the design of "value for money" tests. Alberta created the first such agency in 1999, followed by British Columbia in 2002, Quebec in 2004 and Ontario in 2006. In 2008 the federal government authorized the creation of its own promotion and technical assistance agency, PPP Canada, and the following year it began to administer a Cdn$1.25 billion fund to pay up to 25 percent of the capital costs of P3s that would not otherwise be financially viable; a second fund with another Cdn$1.25 billion was authorized a few years later.

These efforts seem to have been very successful in increasing the number of highway P3s that reached financial close, at least compared to the number in the United States. In the past decade and a half, Canada closed roughly half as many highway P3s as the United States despite the fact that it has a population one-tenth as large. Many observers give the credit to the provincial procurement agencies, which, unlike their US counterparts, pay competitive wages and thus do not suffer from high turnover.

Mexico

Mexico is worth mentioning since it was not just a pioneer but has the largest concession toll road network on the continent. The program was initiated in 1989 by President Carlos Salinas as a way to stimulate the economy and was so attractive

6. For a brief history of 407-ETR, see Minnesota Department of Transportation, "Innovative Finance in Action: Toronto 407 ETR," October 2009, www.dot.state.mn.us/funding/innovative

that by 1994 fifty-two concessions had been awarded for 5,200 kilometres, two-thirds offered by the national government and one-third by state governments. The awards stopped after the sharp devaluation of the peso in 1994 threw the economy into a recession, cutting traffic volumes and revenues while also raising the costs of debt service for many concessionaires who had borrowed in dollars but had not hedged their foreign exchange risk. The financial problems of the concessionaires also threatened to bring down major Mexican banks that had loaned generously to the sector, and so between 1995 and 1997 the national government paid the bank debts of and took back twenty-three of the worst-performing concessions. In 2003 the government began to auction some of these concessions to the private sector again.

The original Mexican program is often described as a failure because so many concessions had to be taken over at substantial cost to the government. And the effects of the peso devaluation were exacerbated by some errors in the design of the program. For example, President Salinas had been concerned that P3s would be controversial and so wanted the highways to be transferred to the government as soon as possible. To that end the concessions were awarded to the bidder who proposed the shortest duration for a given maximum toll, which resulted in some very short concessions based on toll rates that proved prohibitively high in a recession. Nevertheless, by 2003 many of the roads were profitable enough to concession again, and simple calculations suggest that most could have survived the recession had lenders been more patient.

THREE MOTIVES FOR PARTNERSHIP

What has all this activity taught us about where P3s are economically sensible and politically acceptable? To understand, it helps to consider the different motives that are often offered by proponents of P3s. At the risk of much simplification, proponents often offer three motives for partnerships in infrastructure.

The first motive is to tap private capital markets to finance badly needed investments. This motive is most often cited for greenfield projects such as a concession to design, finance, build, and operate a new toll road or power plant for a fixed term.

The second motive is to transfer resources to provide immediate budget relief for hard-pressed governments. This motive is most often associated with brownfield projects that involve the lease for a fixed term or outright sale of an existing facility or enterprise. Examples include the sale of an existing state-owned railroad or the lease of an existing toll road. The line between greenfield and brownfield projects is sometimes blurred, in that the lessee of the brownfield facility may have responsibility to improve it—but the primary motive is typically less to encourage investment than to provide the government with immediate budget relief by spinning off a loss-making activity or by capitalizing the surpluses of a profitable facility.

The third motive is to incentivize real efficiency gains. To understand the difference between this motive and the second, it is important to distinguish what economists call transfers from what they call real efficiency gains. Transfers occur when one simply shifts resources from one party to another without making significant additional changes in the way the resources are used. Real efficiency gains occur when one deploys resources so that they produce more or better output with the same inputs or so that they require fewer inputs to produce the same output. Partnerships often include a mix of transfers and real efficiency gains, but one form or the other usually dominates.

Tapping Private Capital Markets. Tapping private capital markets is widely recognized as a fairly unconvincing rationale for partnership. The objection is that governments can usually tap private capital markets directly—by issuing public debt—instead of borrowing through their private partner.

Partnerships are not a source of free funding. The private investors in a concession or a lease expect to be repaid, just as the holders of government bonds do. And they both draw on the same two main sources for repayment: either charges paid by infrastructure users, such as highway tolls, or taxes.

Moreover, government debt is often cheaper, at least nominally, than the returns that investors in private equity and debt expect. In the United States, for example, state governments can typically borrow at 5 percent to 6 percent while the weighted average return on debt and equity for private investors in infrastructure is on the order of 8 percent to 9 percent. Similarly, in developing countries, the interest paid on sovereign debt is almost always lower than the returns expected by investors in private enterprises in the same country.

The lower cost of government debt is at least partially an illusion for two reasons. The first, which I believe is peculiar to the United States, is that the interest paid on bonds issued by state governments is not subject to federal income tax. This favourable tax treatment accounts for roughly half the difference between the interest rates on state government bonds and the rate on otherwise comparable private bonds in the United States. But this savings in interest rates does not reflect a real difference in state and private risks; rather, that the federal treasury effectively subsidizes the interest on state bonds in the form of foregone tax revenues.

The second and more common reason that lower interest rates on government debt may be an illusion is that the taxpayers may not be fully compensated for the default risks they assume. If a government-financed project performs so poorly that it cannot make the required payments to its bondholders, then there is usually an explicit or implicit understanding that general tax revenues will be used to prevent default. But if the poorly performing project is privately financed, the taxpayers are not expected to step in to prevent bankruptcy. The government can issue revenue bonds, however, backed in theory only by the revenue stream from the project rather than by the full faith and credit of the Treasury. And comparisons are further complicated because government revenue bonds are often subject to minimum coverage ratios that provide a financial cushion similar to equity. In short, if one

made allowances for differences in tax treatment and default risk, the real costs of public and private finance would likely be similar.

The Private Activity Bonds program in the United States can be understood as an attempt to put public and private finance on an even footing by extending the tax advantages of state bonds to private infrastructure. However, the lower interest rates and forgiving terms of TIFIA program should be more properly regarded as a general subsidy to infrastructure, since TIFIA loans and guarantees are available to public as well as private infrastructure providers. This subsidy is substantial, moreover, since TIFIA debt can cover as much as 49 percent of a project's costs, interest rates are as low as 2.54 percent, and repayment can be up to thirty-five years including five years of capitalized interest.[7]

But the key point is that if the primary motive for partnership is to borrow money, then issuing government debt is a much less cumbersome way to do so. Even if the costs of public and private finance are comparable, the transaction costs of designing, awarding and administering a concession or a lease are much greater than the transaction costs of issuing a bond. And if public finance is actually cheaper than private finance (or if the nominal savings is politically salient) then the practice followed in Highway 407, the Chicago Skyway, and others of using some of the proceeds of asset recycling to retire public debt makes little sense. In essence one is borrowing money at interest rates of 8 percent to 9 percent to pay off debts charging only 5 percent to 6 percent.

Transfer Resources for Immediate Budget Relief. The second common motive for infrastructure partnerships is to transfer resources for immediate budget relief. Such partnerships generally take different forms in developing than in developed countries.

In developing countries, this type of project often involves the lease or sale of a state-owned infrastructure facility or enterprise that is losing money because its tariffs are unrealistically low, its staffing is unnecessarily high, or its services are too extensive. The expectation is that the private concessionaire will be better motivated to raise fares, shed excess labour, or cut services so that government financial support is reduced or no longer needed. In essence these projects transfer resources from the user (who pays more) or labour (who must find another job) to taxpayers (who no longer have to support the enterprise).

In developed countries, these partnerships often take the form of asset monetization or recycling—the lease or sale of a profitable infrastructure facility in return for an upfront payment that can be used for other public purposes. In essence such projects are just a means to transfer resources from future taxpayers (who no longer enjoy the current surpluses generated by the asset) to current taxpayers (who enjoy the use of the upfront payment).

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7. TIFIA interest rates as of 31 March 2013.

If public-private partnerships are all about transfers, then partnerships become a zero-sum game where some parties lose at the expense of others. And to the extent that partnerships are zero-sum, they are bound to be more controversial. Early in the decade of the noughts, for example, there was a backlash against privatization of utilities in many developing countries that was fuelled by the perception that the distribution of the benefits and costs of the privatization was too unequal. And something similar has happened with some of the asset-recycling projects—perhaps most famously the uproar over the leasing of thousands of parking meters in downtown Chicago.

The likelihood of a backlash probably depends on how aggressive the asset recycling is, and particularly whether the upfront payment is financed primarily from existing surpluses or relies on raising tolls.

The Chicago Skyway, Indiana Toll Road, and Pennsylvania Turnpike leases all incorporated the same provision that toll rates could be increased every year by 2 percent, the increase in the CPI, or the increase in GDP per capita, whichever was higher. And the bids received implied that the winners were relying primarily on toll increases rather than on the current net cash flow. In the case of the Pennsylvania Turnpike, for example, the value of the current net cash flow accounted for roughly $4 billion of the $12.8 billion bid, and efficiency gains no more than another $1 billion, while the balance of $7–8 billion must have rested on expected increases in toll revenues.

If the upfront payment is primarily the capitalization of existing surpluses, then the transfer (from future taxpayers who lose the use of those surpluses to current taxpayers who gain their use) is likely to be lost in the broader ups and downs of the government budget. But if the upfront payment depends primarily on increasing tolls, then the transfer (from future motorists to current taxpayers) will become very visible over time as tolls increase.

Real Efficiency Gains. The third and most convincing motivation for P3s in infrastructure is to incentivize real efficiency gains. Real efficiency gains are the only way of converting a P3 from a zero-sum game to a win-win policy—or at least to a policy where most parties benefit and those who do not benefit lose only a little.

It is important to note here that the desire to motivate real efficiency gains is the principal reason for using costly private finance. The investments by equity and debt holders are needed to give them a stake in the success of the concession. And in this vein it is possible to have too little private investment.

Mindful that public finance is at least nominally cheaper than private finance, some projects are being designed to use a mixture of public and private finance. An increasingly common way of doing so is to compensate the concessionaire with a combination of milestone or progress payments and availability payments. The milestone payments are typically paid during construction and financed with inexpensive public debt while the availability payments are paid once the facility is in service and financed with private equity and debt.

The effect of such mixed finance can be to reduce the private investor's stake in the project to dangerously low levels. Imagine a concession for a bridge that costs $1 billion to build where the construction and operating costs are to be repaid over several decades through availability payments financed with 70 percent private debt and 30 percent private equity. If instead half of the construction costs are repaid through progress payments during construction, the balance is repaid through availability payments over several decades and the 70–30 mix of debt and equity is retained, then effectively the equity investor would be left with only a 15 percent stake in a $1 billion project. Lenders might insist on a larger equity share to compensate, but if not, the incentive of the concessionaire to walk away from serious problems would be significantly increased.

There are many anecdotes but little systematic evidence on the extent to which P3s generate real efficiency gains. Most Canadian provinces and a few US states require so-called "value for money" analyses to test whether a partnership would be cheaper than a traditional procurement before any partnership is approved. Those cost comparisons are difficult to do well, however, especially valuing the savings to the public sector from any risks transferred to the private partner. Moreover, their accuracy is hard to test in that only one of the two options will ever be built.

Several studies have attempted to match projects procured through P3s with otherwise similar projects procured through traditional approaches, and they find that the P3 projects are more likely to be built and opened on time and within budget. Most of the projects involve schools, hospitals, and other accommodations, although there is no reason to believe their results would not apply to highways. A more troublesome concern is that they examine only construction costs and timeliness. While savings in construction costs and putting the asset in service more quickly are classic efficiency gains, partnerships in infrastructure are advanced in part on the hope of lifecycle cost savings. And lifecycle savings are hard to observe because partnerships have not been around for long.

It is important to understand that the profitability of the concessionaire or lessee is not necessarily an indication of whether the project has generated real efficiency gains for society. The concessionaire's profits are potentially misleading in that they include only those costs and benefits that affect the concessionaire financially. What is needed is a social benefit-cost analysis that counts benefits and costs to whomsoever they accrue and whether they are measured in monetary terms or not. A highway lease could be highly profitable but cause real efficiency losses if, for example, the lessor sought to increase the upfront payment by raising toll rates to the point where the highway was underutilized while parallel roads were highly congested. And a lease could be highly unprofitable but generate real efficiency gains if the winning bidder was simply over-optimistic.

In sum, the key is to look for projects where there is reason to believe that the private provider can offer real efficiency gains and is not just in the business of borrowing money or promoting transfers.

DESIGNING CONTRACTS

The Role of Contracts. A second concern is the design of the concession and lease contracts that are used to implement these partnerships. Formal contracts are typically used for partnerships in infrastructure because highways and other forms of infrastructure are often thought to have the characteristics of natural monopoly.

A natural monopoly occurs when the economies of scale for producing a service are so large that the least-cost way of serving a market is through a single firm. If there are also no close substitutes for the service in question, then the firm may be able to exploit its position by charging tariffs well above its costs. High-performance highways typically enjoy economies of scale in that capacity often increases faster than cost as the road is widened or otherwise improved. And while there is competition from parallel roads or other modes of transport, the alternatives are not always attractive enough to prevent a toll-road operator from exercising market power.

Competitively procured concession or lease contracts offer a simple, transparent, and fair method of setting tariffs and service standards for a natural monopoly. These contracts attempt to prevent opportunistic behaviour by describing completely the obligations of the government and the private partner to one another. The usual concern is that the private partner will be vulnerable to the government because the investments the partner typically makes are durable and immobile. But the durability and immobility of the investments also make the government vulnerable to the private partner in that once those assets are in place the threat of entry by a competitor is much reduced. If the contract is competitively procured, then the public has some assurance that the terms are fair. And if the contract expires and is rebid periodically, then the terms will be up to date.

The Problem of Incomplete Contracts. A key drawback of the contractual approach is the risk that the contract will prove to be incomplete in some important way. A contract is incomplete if it fails to foresee some significant relevant development and provide an appropriate contingency for it. For example, traffic growth might be faster than expected so that the widening of the highway is needed sooner than anticipated.

If a contract proves to be incomplete in an important way, then the parties face a difficult choice of either (1) living with the shortcomings until the contract is scheduled to expire and can be rebid, or (2) renegotiating the contract before its expiration but without the protection of competitive bidding. Renegotiation may set a bad precedent by establishing the expectation that bids don't have to be realistic because they can be renegotiated if trouble arises. And renegotiation may undermine popular support for P3s, particularly in countries where citizens have less faith in the integrity of their government officials than they do in Canada or the United States.

The risk of an incomplete contract is obviously lower if the relevant technological, economic, and political environments of the project are stable so that it is

easier to predict the services that are likely to be desired in the future. The risk also falls to the extent that the project is standalone, in the sense that its success does not depend critically on the performance of many other actors. And perhaps most obvious, the risk decreases the shorter the term of the contract, since it is easier to foresee the near than the distant future.

By these standards the risk of an incomplete contract should be relatively low for highways in North America. Highway technology is relatively stable, at least compared to other forms of infrastructure, notably telecommunications and energy, as is the economic and political environment in North America, at least compared to that of many developing countries. Moreover, while a highway project often depends on access or connecting roads to feed it traffic and on limiting competition from parallel roads, these vulnerabilities are often manageable. Contracts can specify the standards to which key feeder and parallel routes should be maintained, for example, and who is responsible for meeting those standards. Or if specifying the standards for the life of the contract is too difficult, the government can take the demand risk by providing compensation based on the availability of the highway rather than actual traffic volumes. Managing the interfaces between the concessionaire or lessee and other relevant parties is not easy in highways, but the task is generally more obvious and tractable than in other forms of infrastructure.

A key problem, however, is that the lease and concession contracts in highways are often for fairly long terms. Of the twenty-five significant projects, for example, nine have contracts for fifty years or longer including three for ninety-nine years (Highway 407, Chicago Skyway, Northwest Parkway) and another three for seventy-three or seventy-five years. It is hard to imagine that these contracts will survive intact for fifty years, never mind for seventy-five or ninety-nine. Most of the extremely long-lived contracts are for asset-recycling projects where the desire to maximize the upfront payment appears to have overwhelmed realistic considerations of contractual completeness.

Among the remaining sixteen projects with contracts under fifty years, the shortest are two for thirty years, with most clustering around thirty-five to forty years. Many of these are greenfield projects where the main consideration probably was to set a time period long enough to recoup the capital investment without charging very high tolls. But even thirty to thirty-five years seems a long time to expect a contract to survive.

Solutions. Obviously it is important to try to foresee the important possibilities and write workable contingencies into the contract. But it will be difficult to foresee every eventuality even for a relatively simple concession in a comparatively stable environment. And even if one could identify all the uncertainties, inserting many contingencies can make the contract so complex that it introduces rigidities and vulnerabilities that are poorly understood.

Another possibility is to reduce the duration of the contracts. Relatively short contracts of twenty to twenty-five years might reduce the risk of incompleteness considerably without sacrificing greatly on upfront payments or reasonable tolls.

If the weighted average cost of private capital is 8 percent, for example, then shortening the life of a lease from thirty-five to twenty-five years would reduce the present value of equal annual availability payments by only 8.5 percent. And if one considers only returns to equity and where equity expects a return of 12 percent, then shortening the lease from thirty-five to twenty-five years reduces the present value of payments by only 5.2 percent.[8] It is hard to know how much a twenty-five-year concession would reduce the risk of incompleteness, but the cost seems modest in terms of the reduced upfront payment or construction cost that partnership could support.

If the duration of the concessions is not reduced, then more attention should be devoted to various forms of dispute resolution in the contract, particularly buyout clauses and arbitration. Buyout clauses are important because they provide the government and the concessionaire an option to resolve unanticipated problems by ending the contract early and perhaps auctioning it again with revised terms. Most of the focus is on clauses that specify the compensation that the government must pay in the event that it terminates the contract for its convenience rather than for cause. Often the outstanding debt is paid in full and equity is compensated on a sliding scale depending on how long the concession has been in operation or the dividends actually distributed. Devising a formula for equity compensation that is fair is not easy, however.

A concession scheme created by Eduardo Engel provides a clever, simple, and fair method for determining compensation. In Engel's scheme the concession is awarded competitively to the bidder who requires payments that have the least present value at a specified discount rate. (The payments can be either toll revenues or availability payments, depending on whether the government wants to assume the demand risk.) The concession reverts to the government when the concessionaire has received the amount it bid. If the government wants to terminate the contract early, it simply pays the outstanding balance of the least present value. Concessionaires don't like this scheme because it caps the upside potential, but it has been used in a number of Latin American countries.

Buyout clauses for concessionaires have received less attention perhaps because the concessionaires can, and often do, respond to serious unanticipated problems by declaring bankruptcy or a financial restructuring in which the equity investors lose all or much of their investment. If other investors buy the concession from its original owners and assume its obligations to the government, they presumably pay a price discounted for the cost of the unanticipated difficulties.

Arbitration is of interest because it provides an opportunity to fashion remedies for unanticipated difficulties that are less draconian than buyouts. However, devising

8. At 8 percent interest the present value of an annuity of $1 for thirty-five years is $9.16 while $1 for twenty-five years is worth $8.78. At 12 percent interest, the present values are $12.59 and $11.53 respectively.

an arbitration scheme that both parties will be willing to use when the stakes are high is particularly difficult. For example, conventional three-person arbitration panels—where each party chooses a member and the two members must agree on a third—are often seen as risky since the decision seems likely to hinge heavily on the views of the third member. Best-and-final-offer arbitration—where the arbitrator must choose between the best and final offers of each party, without revisions—is more attractive because it encourages both parties to be reasonable, although it may leave the more risk-averse party at a disadvantage.

Among the twenty-five significant highway P3s, there are only two cases where the government bought out the concessionaire but ten cases where the concessionaire has declared bankruptcy or has undergone a significant financial restructuring (counting the early Mexico program as a single case). One government buyout was for the SR-91 express lanes and occurred because the Orange County Transportation Authority wanted to increase the number of general-purpose lanes on the highway to cope with unexpectedly rapid traffic growth but the terms of the concession prohibited it from doing so. The second buyout was of SR-125, a ten-mile toll road in San Diego that had gone bankrupt; in this case the San Diego Association of Governments took advantage of the bankruptcy to buy the road for roughly one-third of what it had cost the private concessionaire to build in order to ensure that future tolls would be reasonable. The ten financial restructurings are typically the result of shortfalls in traffic and thus are not so much the product of unforeseen problems as an overly optimistic assessment of the severity of a widely recognized problem.

This pattern of more bankruptcies than government buyouts presumably reflects in part the fact that many of the twenty-five P3s were awarded only recently, and the private party almost always assumes the risk of construction-cost overruns and often the risks of demand shortfalls as well—both risks that are resolved soon after the project is open to traffic. Over time one would expect government initiated buyouts or renegotiation to become more common.

CONCLUSIONS

Public-private partnerships in infrastructure are still something of a novelty in North America, although arguably less so in highways than in other sectors. Highway P3s began only in the late 1980s and, Mexico aside, accounted for only a handful of projects as late as the 1990s. And in the United States the prohibition on collecting tolls on those portions of the Interstate and Defense Highway System that were built using federal gas taxes continues to limit the possibilities.

There has been no careful ex-post empirical evaluation of the experience with highway P3s in North America. Part of the problem is that it is a little early for an evaluation because most of the highways involve long-term investments but many

have only just recently reached financial close or opened to traffic. Evaluation is further complicated by the fact that the projects selected for P3s often involve difficult or unusual construction challenges that make it hard to identify for comparison purposes similar projects that were procured with traditional procedures.

Nevertheless, both the North American experience and common sense suggest that highway P3s are more likely to be economically sensible and politically acceptable if the partnerships are designed primarily as a means of increasing real efficiency in the delivery of infrastructure services and not simply as vehicles for accessing private capital markets or alleviating immediate budget problems. If the main purpose of a P3 is to borrow money, then issuing government bonds is a less cumbersome and often cheaper way to do so. And if the main purpose is simply to transfer resources from one party to another, as in some of the more aggressive asset-recycling projects, then the P3 is likely to be politically controversial. Real efficiency gains are the only way that all or most of those affected by a project might benefit.

If we are to expand the use of P3s in infrastructure, however, we should take care to draft contracts between the public and private partners that reduce the risk that the terms eventually prove so unworkable for one or both parties that they lead to potentially controversial renegotiations. Incomplete contracts have been less of a problem for government than for concessionaires, although they are likely to become more common for government as the concessions age. Both parties should work hard to identify the problems that might arise and provide workable contingencies in the contracts. But recognizing that it is hard to foresee all the problems that might arise, they should also consider somewhat shorter contracts to reduce the risk of unanticipated problems and include workable buyout or arbitration clauses to deal with unanticipated problems.

14

THE ABORIGINAL RESOURCE TAX: CLOSING THE INFRASTRUCTURE GAP

Greg Richard

OVERVIEW

The Aboriginal Resource Tax (ART)[1] is being proposed, in part, to help First Nations address their own infrastructure deficit, which is far more acute than those in the rest of Canada.[2] However, the ART has a unique feature: it generates funds, in part, by improving the investment climate, and so it does not necessarily compete for infrastructure funding with other governments. Instead, it helps all governments.

The ART has been designed to meet some of the specific challenges that the recognition of Aboriginal title has created for investors and First Nations with respect to resource development. It is simply taking too long to navigate the consent

1. The report on which this chapter is based was initially prepared by Greg Richard of Fiscal Realities Economists, for the First Nations Tax Commission, and presented at the State of the Federation conference to stimulate discussion of the ART. We are grateful to both Fiscal Realities Economists and the FNTC for permission to reproduce it here. We note, however, that the views presented are those of the author and not necessarily those of the FNTC.

2. Infrastructure issues on reserves are in many cases posing major threats to health and safety. See http://www.cbc.ca/news/canada/clean-running-water-still-a-luxury-on-many-native-reserves-1.1081705. Some estimates are that the First Nations infrastructure gap is more than $40 billion, an enormous fund for relatively small First Nations. http://www.wawataynews.ca/archive/all/2011/9/1/huge-first-nations-infrastructure-gap-reported_21819

process.[3] This lengthy process is slowing investment, and slow investment has implications for the ability of Canada to fund infrastructure. The essence of the policy rationale for the ART is that it will speed up the process. It will replace the need to negotiate and manage unique financial agreements for every project or expansion, with a pre-specified tax that would be applied automatically if a project is approved.

However, while the ART was designed to address the specific issues raised by Aboriginal title, it would be applicable in other contexts, where First Nation issues intersect with resource development. For example, First Nations asserting treaty rights may raise similar issues.[4] Not surprisingly, the resource industry wants to see outstanding First Nations issues addressed all across the country before committing substantial funds. The ART could provide the foundation of a solution for these First Nations as well.

The ART is designed to ensure that "good" projects are not screened out just because the approval process itself was too difficult. However, it is not intended to reduce in any way the scrutiny that projects receive.

The ART would improve investment in several ways. It would reduce the administrative burden of the current process by replacing the need for repeated negotiations with a pre-specified tax regime. It would create certainty and transparency by ensuring that tax rates are pre-specified and published. It is intended that the ART would be implemented in a revenue-neutral manner. It is expected that a coordination agreement would be worked out whereby other governments would vacate revenue room roughly equivalent to the revenue potential of the ART. First Nations that implement the ART would not seek royalty sharing or pursue additional revenue agreements with companies undertaking projects on their territory.

WHY THE ART IS NECESSARY

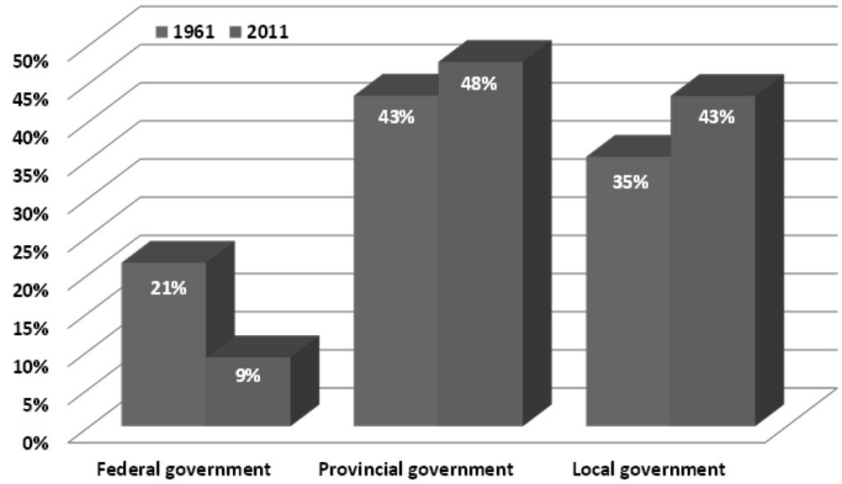
There are five considerations behind the policy rationale of the ART. First, Canada needs resource investment to maintain living standards and fund services.[5] Second, Canada and the provinces will not get adequate investment unless a mechanism is found whereby First Nations can share the revenues generated by resource development. Third, current revenue-sharing approaches with provinces have limitations. Fourth, current revenue agreements with companies are just pseudo-taxation. And

3. http://www.theglobeandmail.com/globe-debate/the-world-wont-wait-for-bcs-lng/article24674728/

4. http://www.theglobeandmail.com/globe-debate/first-nations-dont-have-a-pipeline-veto-but-they-do-have-options/article547673/

5. http://www.financialpost.com/m/wp/news/blog.html?b=business.financialpost.com/news/energy/no-achilles-heel-resource-sector-has-super-sized-impact-on-economy&pubdate=2015-05-29

Figure 14.1: Fixed Capital Investment (Share by Government)



fifth, the ART would be the best mechanism to provide a stable secure fiscal benefit to First Nations from resource development. These considerations are further discussed below.

Canada Needs Resource Investment to Fund Infrastructure

Canada needs the revenues that resource investment could deliver. The Parliamentary Budget Office (PBO) has analyzed the fiscal challenges facing Canadian governments and concluded that present levels of provincial services are not fiscally sustainable without some combination of large expenditure cuts or tax increases.[6] It will become increasingly difficult to fund new infrastructure or even maintain the existing stock.

The fact that the fiscal challenge is going to be acute at the provincial level is particularly problematic for infrastructure provision. As Figure 14.1 above shows, the majority of infrastructure expenditures are at the provincial and local level.

The challenges and unpleasant fiscal choices facing provincial governments can be ameliorated by greater federal contributions and/or productivity improvements.

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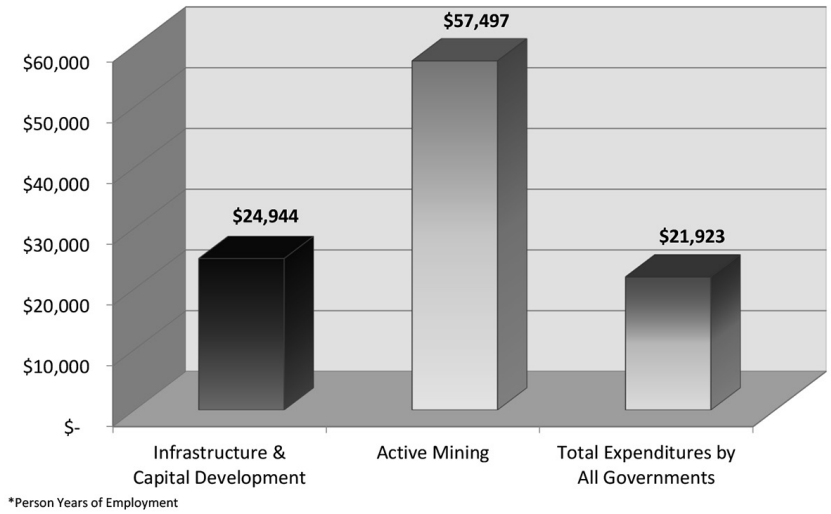
6. http://news.nationalpost.com/news/canada/canadian-politics/ottawas-overhaul-of-health-care-funding-has-left-enormous-fiscal-gap-for-provinces-pbo-warns

Figure 14.2:



Note: The figure illustrates the typical net fiscal contribution per worker of an average mine during its development and then operations phases.

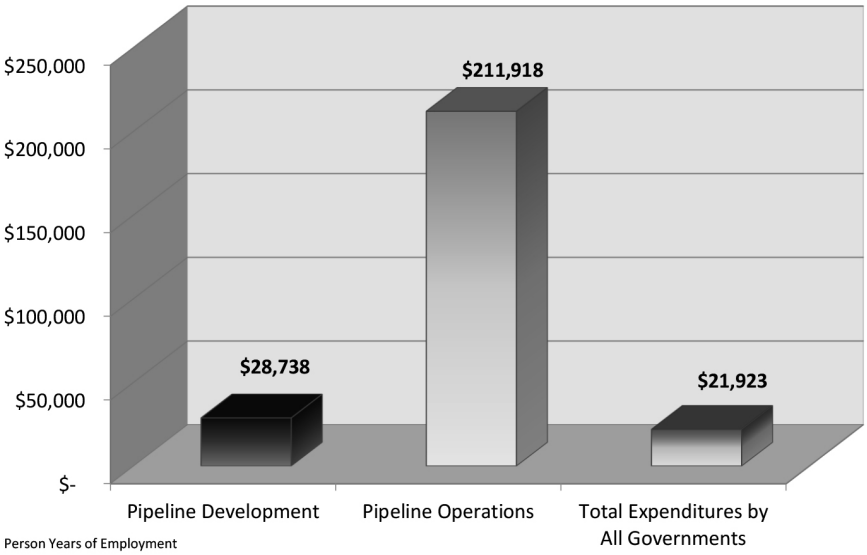
Productivity improvements would cause government revenues to grow faster than forecast, creating the fiscal room needed to fund infrastructure. Resource projects are particularly well suited to generate growth, as they produce high-paying private sector jobs that are strong net contributors to the tax base.

This is illustrated in Figure 14.2 and Figure 14.3. They show the net contribution of resource-sector workers to the fiscal balance in Canada. They are not paid out of tax dollars, but they contribute very large amounts of tax dollars. The models are underestimates of the true fiscal contribution, as they are based on income tax and royalties only.

The bar on the left of each graph shows the income tax and royalty contribution per worker during the development or construction phase of mine and pipeline. The middle bar shows the income tax and royalty contribution per worker during the operation phase of a mine and pipeline. The bar on the right is the total expenditure per capita by all governments.

The supplement summarizes the estimation methods, but the key point is that mines and pipelines generate more government revenues per worker than they consume in government expenditures per worker. This resource fiscal premium contributes significantly to physical infrastructure and social programs in Canada.

Figure 14.3:



Note: The figure shows the average net fiscal contribution per worker of a pipeline project during its construction and then operating phase.

First Nations Need a Fiscal Stake in Resource Investment

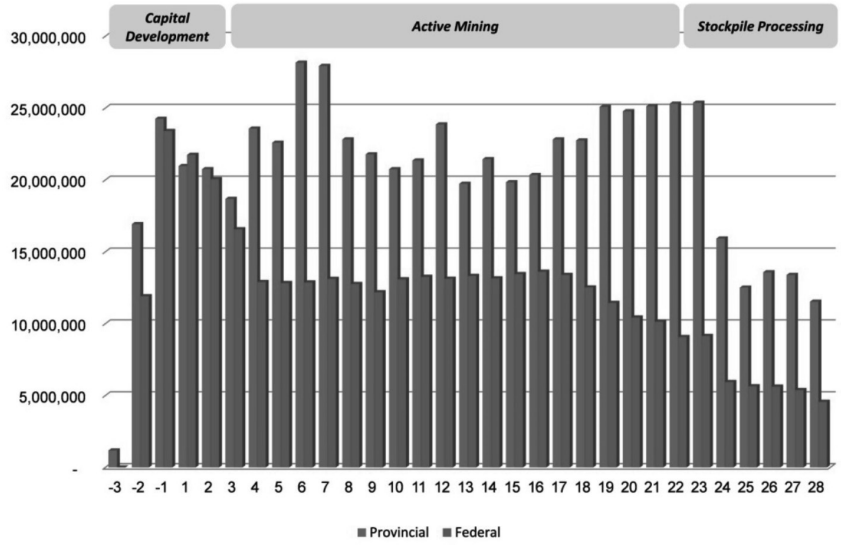
A resource strategy needs to be part of a productivity strategy. However, Canada is getting a poor reputation as a place for resource investments.[7] A large part of the reason is the perceived lack of resolution of First Nations issues.[8] Investors are not sure what is required to get consent, how long it will take, or, in many cases, whether it will ever be possible to gain consent since they are not sure what a First Nation's expectations would be with respect to a project.

The truth is that there is no panacea, and no one-size-fits-all solution for addressing First Nation issues. Every project raises unique issues and every First Nation has distinct interests, and many of these issues are not financial. Nonetheless, it is fair to say that in virtually every case where a deal is possible, *First Nations want to share in the government revenues generated by projects on their territory*. This

7. http://www.timminspress.com/2015/03/05/cda-gaining-poor-rep-starting-up-mining-projects--charest

8. http://business.financialpost.com/news/energy/170-legal-victories-empower-first-nations-in-fight-over-resource-development?__lsa=2d40-46b2

Figure 14.4: Taxes Collected Over the Life of a Typical Mine



is the "fiscal issue" and its resolution is a necessary, but not a sufficient, condition for gaining First Nations support.

The First Nations perspective on the fiscal issue warrants some elaboration. Consider the situation in a First Nation where a resource project is proposed for its territory but there is no royalty sharing—such as was the case prior to the development of royalty sharing or as still exists in some provinces. This project would generate millions of dollars in tax revenues over its lifetime. A typical mine is used in Figure 14.4 for illustrative purposes.[9] Those revenues would then be shared between the federal and provincial/local orders of government. The First Nations upon whose (traditional) territory these projects took place would receive no direct revenues. (For the methodology used in producing these revenues, see Supplement 14A.)

The First Nation(s) would also not typically receive any of the indirect fiscal benefits generated by these revenues, such as increased programming or transfers.

The provincial position is that "provincial" services to First Nation persons are a federal responsibility, and so First Nation persons on reserve are specifically

9. The revenues that were estimated include mining taxes and the income, sales, and property tax paid by workers and the company.

excluded. Consequently, the only benefit received from the new provincial revenues would be through generally available services such as highways.

The federal government does not typically link its transfers to First Nations to the development of federal revenues on that First Nation's territory. Instead, it has implemented what chiefs call a "cap" on transfers—a 2 percent per annum growth rate. This rate is not keeping pace with population growth and inflation; it is also below the proposed growth of federal CHST transfers.

The bottom line is that, under these arrangements, existing service and infrastructure disparities will actually widen for many First Nations even as resource projects proceed on their territory. This outcome is difficult to square with the First Nations' position that they have unique rights to the land as a result of treaties or Aboriginal title; so long as this situation persists, it is going to be difficult to secure First Nations support for projects.

The Limitation of Revenue Sharing

The challenge is to develop a mechanism whereby First Nations can share in the revenues generated by resource projects on their territory. This is the fiscal issue. One mechanism for addressing the fiscal issue is "revenue sharing." In some cases, revenue sharing is packaged together with a complementary approach whereby a First Nation secures revenues directly from the company that is proposing the project. This complementary approach develops what are called "revenue agreements."

Revenue sharing and revenue agreements are obviously a vast improvement over nothing at all. However, they also have flaws and limitations that could be addressed through the development of the ART.

Revenue sharing involves a provincial government sharing with a First Nation whose territory is impacted by a specific project, the resource-tax revenues generated by that project. It is used by several provinces. It provides First Nations with a real fiscal stake in projects on their territory: there is a clear linkage between the wealth created by the land and the resources and the shared revenues received by the First Nation. It is not, however, without flaws. Issues that come to mind—which would be remedied by the implementation of the ART—include the following:

1. Many projects subject to First Nations approval don't earn resource taxes or royalties. This is an issue with the current pipeline proposals.
2. Some projects span multiple provinces, and these projects are not well suited to the sharing of a provincial royalty. Again, this is an issue with respect to pipelines.
3. Royalties are essentially a profit tax, and hence they can be more volatile than other government revenues. This is problematic because First Nation governments are small and undiversified and are less able than other governments to bear volatility.

4. Royalties are not earned over the entire life of a project. Most First Nations wish to see their remuneration begin as soon as a project impacts the land. Royalties are typically not earned until several years after a project is initiated. Consequently, it may be years before they receive revenues, and this delay creates political difficulties for any chief and council that wish to advocate a project.
5. Royalty policy is controlled by the province. The amount of money generated by a resource tax is going to be determined by provincial policy. The province may change its policy without reference to the impact on the revenues of the First Nations with whom it is sharing revenues.
6. The provinces have less revenue room than the federal government over the long term. Consequently, they will be less able to share revenues over the long term.
7. Royalties are a provincial jurisdiction, but First Nations are a federal responsibility. When provinces share revenues, they take a revenue loss, yet most of the reassigned revenues serve federal rather than provincial goals.

The Limitations of Revenue Agreements

In addition to revenue-sharing, many First Nations and project proponents have agreements for negotiated payments from the project proponent to the First Nation. This approach is really pseudo-taxation, sharing many of the attributes of taxation but without being recognized as such. Compensation under revenue agreements may take many forms, such as signing bonuses, formula-based payments, or milestone payments. Problems with this pseudo-taxation include:

1. These agreements are a hidden and additional tax.
2. They are not pre-specified, and so there are substantial costs and time delays associated with working out their terms.
3. They are potentially subject to claw-backs from the federal government through transfer offsets.

WHY THE ART IS AN IMPROVEMENT

The ART is suggested as an alternative to both royalty sharing and revenue agreements. The basic premise of the ART is that it simply doesn't make sense for small First Nations to negotiate what is essentially a unique tax every time a new project is developed on their territories. The existing approach guarantees that investment

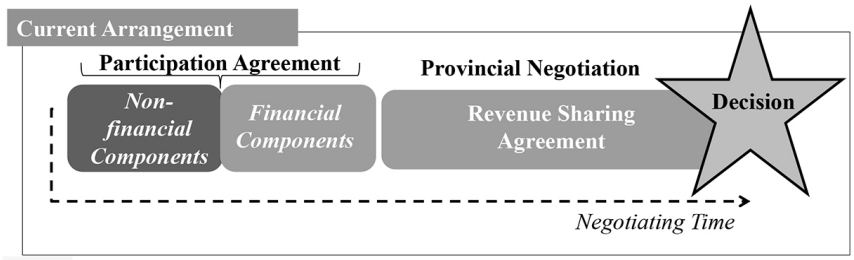
moves no faster than the capacity of small First Nation administrations to consider proposals.

ART has several key advantages:

1. It provides a real recognition of First Nation Treaty rights and/or Aboriginal title. The ART would create a First Nations tax rather than simply share a tax collected under another government's authority. The ART is based on a philosophy of defining the meaning of First Nations jurisdiction, coordinating it with other rights, and then implementing. Its agenda is not to extinguish rights.
2. It would provide many First Nations with their first opportunity to directly share in the fiscal benefits brought by resource development on their territories.
3. It would improve the investment-facilitation process. The current process for gaining the consent of First Nations for resource and infrastructure projects is a two-stage process in cases where there is a provincial royalty-sharing policy. Where this is not provincial policy, there is only one stage: the negotiation of revenue agreements with the project's private-sector proponents. However, when there is only one stage, the First Nation usually seeks more stringent terms.

Figure 14.5 below shows a typical process for gaining First Nations consent in British Columbia, where the province typically shares royalties with First Nations who have an Aboriginal title claim. This two-stage process begins with a negotiation between the First Nation and the company proponent. Non-financial components typically include an identification of impacts on the environment and traditional way of life as well as ameliorations. This stage would also typically include other measures such as preferential job placement and access to contracting opportunities, mechanisms for information, and ongoing participation in management. The item marked "financial components" is a catch-all phrase that includes the revenue agreements. Only when this stage is complete does the second stage begin,

Figure 14.5: Timeline of a Typical Agreement under the Revenue-Sharing Approach to Aboriginal Title



which is a negotiation with the province. That second stage typically includes revenue-sharing agreements.

Advantages of the ART

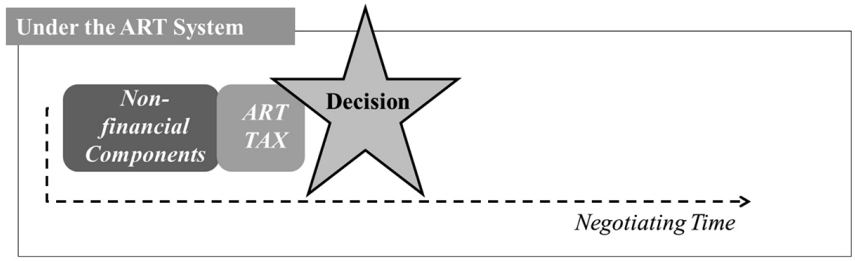
1. *It will reduce the administrative burden on First Nations*. First Nation administrations are relatively small and challenged to meet all the administrative demands currently placed upon them.[10] This burden is making it difficult to expedite decisions about whether or not projects can proceed. The ART would replace the need to negotiate and then manage multiple agreements with a tax administration. It would free up the administrative resources of First Nations and thereby expedite the process.
2. *It will create transparency*. Companies that seek the consent of First Nations for resource projects would prefer to know their likely tax burden from the beginning of the process. This is not possible so long as it is necessary to negotiate revenue agreements with the affected First Nation(s).
3. *It will reduce the cost and complexity of negotiations*. A principal goal of the ART is to reduce the complexity of negotiations with First Nations. The negotiation of revenue agreements between First Nations and companies has been particularly destructive in this regard. It is taking too long and as a result kills good projects. By replacing these negotiations with a pre-specified tax, the ART would simply remove the negotiation about financial matters and reduce the scope of a negotiation.

Figure 14.6 highlights a faster process that would result from the implementation of the ART. There, the complexity of agreements is reduced because the financial components no longer need to be negotiated. Instead, they are replaced by a pre-specified tax that is imposed automatically if the project is approved.

4. *It will create more politically reliable revenues for First Nations*. Revenue sharing is based on the sharing of a tax stream that is controlled by a provincial government. The province in question determines the effective rates, the tax base, and all the other parameters that collectively determine the revenue

10. http://www.oag-bvg.gc.ca/internet/english/parl_oag_201106_04_e_35372.html. This report noted the following: "Reporting requirements: In 2002, we noted that First Nations communities, many of them having fewer than 500 members, had to fill out an excessive number of reports for INAC each year, and that many of the reports were never reviewed and served no purpose." The need to negotiate and manage multiple agreements regarding developments on their territories adds considerably to this administrative burden. In effect, this is the major choke point with respect to the processing of applications in the investment approval process for many different types of resource projects.

Figure 14.6: Streamlining of the Revenue-Sharing Approach as a Result of the Implementation of the ART



potential of the tax in question. This process creates revenue uncertainty that the ART would eliminate.

5. *It will create more economically reliable revenues for First Nations*. Royalties are one of the most volatile tax sources. They work essentially as a profit tax, and profits are more volatile than other tax bases such as income and sales tax. First Nations have relatively small and undiversified revenue bases and are less able to bear such volatility. The ART would allow First Nations to design a more stable and suitable tax in vacated tax room.
6. *It will support a broader range of projects*. Many types of project are not well suited to a royalty-sharing solution. They may not earn royalties or, like pipelines, their principal royalty benefit will be in another province.

WHY SHOULD THE ART BE COST-SHARED?

First Nations have targeted royalties for sharing because, more than other revenues generated by the process of resource development, they are tied closely to the use of the land and resources. It is because of this characteristic—and not because they are a provincial revenue—that they are targeted by the ART.

1. *First Nations are a federal responsibility and the ART will reduce federal liabilities*. The ART will generate revenues that primarily fund areas of federal responsibilities. It will reduce First Nations poverty and support the improvement of housing and infrastructure and thereby reduce federal liabilities.
2. *The ART addresses trans-provincial issues*. A national approach is needed to the fiscal accommodation of First Nations. Some projects, such as pipelines, span multiple provinces. The First Nations that need to be accommodated

may not even be within the province where most of the additional revenues are generated. Federal participation in a program to create tax room for the ART would help address such issues.

3. *It will generate revenues for both orders of government*. The ART will generate revenues for both orders of government if it improves the investment climate. The ART will result in the diversion of income tax paid by First Nation persons to provincial governments, which have no responsibility to supply services to reserves.
4. *It will reduce fiscal imbalance*. The federal government is going to have more fiscal room than either provincial or local governments over the medium to long term. This is the essence of the "fiscal imbalance." If the fiscal accommodation of First Nations is limited to revenue-sharing provincial royalties, this imbalance will be worsened, since it will divert provincial revenues towards federal responsibilities. On the other hand, if the fiscal accommodation of First Nations is accomplished through a vacation of tax room by both orders of government, it will not substantially worsen the fiscal imbalance.

CONCLUSIONS

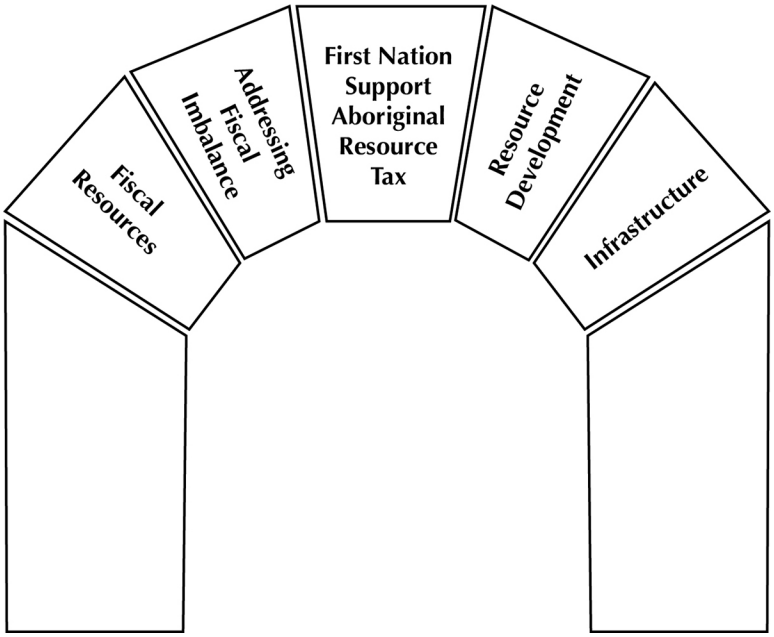
Canada's infrastructure challenge is also a productivity challenge. Part of the solution to this challenge is improving the investment climate, particularly for resources. Resource development produces very high government revenues relative to associated expenditure responsibilities, and its health is also important to the health of other industries, particularly manufacturing.

If Canada is to get the most out of a resource strategy, it needs to do a better job of addressing First Nation issues. At the root of the problem is the fact that First Nations need to share in the revenues generated by resource development on their territories. In some situations, a mechanism to accomplish this end is entirely absent. Even where it is not absent, a better method for securing these revenues is needed. It is simply not possible to have a healthy investment climate when unique negotiations about what is essentially a tax are required every time a new project or expansion occurs.

The ART could provide a better way. It would provide many First Nations with a relatively simple way to share revenues. It would remove the need for complex negotiations by replacing these with simple and pre-specified tax arrangements. Hidden pseudo-taxes would also be removed, and these are particularly destructive with respect to investment.

The ART would provide First Nations with a significant improvement over relatively volatile and unreliable revenue sharing arrangements. It could be developed so as to allow more immediate payment. Finally, if it were cost-shared, it would

Figure 14.7: Creating a Fiscal Stake for First Nations in Resource Projects on Their territory Is a Key to Solving Canada's Productivity Challenge



address a serious issue: it could become a mechanism for addressing the fiscal imbalance rather than worsening it.

The key to the ART would be the creation of revenue room for its implementation, preferably through the development of a federal-provincial tax credit that would be applied against eligible First Nations tax paid by companies.

Figure 14.7 suggests that a key to addressing the infrastructure challenge is the implementation of the ART. The ART would allow First Nations to share the government revenues generated by projects on their territories. These revenues, if properly governed, would help First Nations address their own infrastructure deficit. The ART would address some of the principle challenges facing resource investment and thus help unlock the revenues that it generates and create revenues at the provincial and local level to assist them in their infrastructure challenge. Finally, the ART would allow the fiscal costs of accommodating First Nations to be shifted from being exclusively provincial to cost-shared and thereby address the fiscal imbalance.

The advantages of the ART over other approaches are as follows:

- The ART will create a more reliable revenue streams than other mechanisms. This is important for relatively small and undiversified First Nation economies. It will facilitate easier financing of infrastructure.
- It will demonstrate a real commitment by governments to a strategy of addressing Aboriginal title and treaty rights through clarification and coordination rather than extinguishment.
- It could potentially improve the fiscal balance rather than exacerbate provincial issues as royalty sharing does.
- It will give First Nations a real stake in the success of projects on their territories, providing a better platform for the resolution of other First Nation issues.
- It could replace the current practice of negotiating separate financial arrangements between individual companies and First Nations and could greatly expedite the investment facilitation process.

RECOMMENDATIONS

The ART would provide a very logical complement to existing federal-provincial infrastructure projects. It addresses a mutual interest of all governments, enhances the capacity to support infrastructure, addresses First Nation infrastructure issues, and addresses the fiscal imbalance.

The ART should be supported by a commitment to work with the FNTC on the design of a tax credit that would support its implementation in a tax-neutral manner.

The FNTC would help promote the ART as a solution to the fiscal issues with respect to resource development. The FNTC would do with the ART what it now does with property tax: it would work with First Nations to help them understand it and its potential. It would work with participating First Nations in developing appropriate tax administrations, policies, expenditure laws, financial reporting, budgeting, and fiscal planning to support the ART. (The role of the FNTC for property taxation and infrastructure is described further in Supplement 14B.)

The FNTC would work with participating First Nations in developing supportive fiscal arrangements for the implementation of their ART. This would include appropriate service agreements with other governments and integration of new infrastructure with property tax to support the development of self-financing infrastructure systems.

Supplement 14A

Table 14.1 shows the expected tax revenues per employee from the proposed Kinder Morgan pipeline expansion project in British Columbia. This is an underestimate, in that several major taxes such as sales tax induced per worker have been excluded.

Conference Board estimates were reduced by the difference between the WCS and Brent spreads from November 2013 (publication date) and February 2015: 52.22 percent reduction of base case estimates.

Table 14.1: Estimated Revenue Implications of Proposed Kinder Morgan Pipeline Expansion

Category	Federal	Provincial	Total
Expected annual increase in revenues (associated with two-year TMEP development)	$ 322,900,000	$284,300,000	$607,200,000
Expected annual increase in revenues (over 20 years of TMEP operation)	$ 29,333,894	$19,277,242	$48,611,136
Expected annual increase in revenues (associated with increased producer profits over 20 years)	$144,997,343	$195,113,394	$340,110,737
Expected total annual increase in revenues (development)	$ 322,900,000	$284,300,000	$607,200,000
Expected total annual increase in revenues (operations)	$ 174,331,238	$214,390,635	$388,721,873
Annual fiscal benefit from development per direct/indirect PYE	$ 15,283	$ 13,456	$ 28,738
Annual fiscal benefit from operations per direct/indirect PYE	$ 95,040	$ 116,879	$ 211,918

Base case suggests employment of 14,101 PYE (Person Years of Employment) direct and 7,028 PYE indirect (21,129 PYE) annually for development, and 342 PYE direct and 1,492 PYE indirect (1,834 PYE) annually for operations.

Revenues only include corporate income tax and personal income tax. Property tax, indirect taxes and "other" taxes have been excluded.

Expected increase in revenue from producer profits include corporate income tax (+ royalties for provinces).

MINING REVENUES METHODOLOGY

A typical mineral mine's technical and feasibility study is used extensively to model government revenue impacts for this study.

Where the technical and feasibility estimates could not accurately model government revenues, economic impact ratios are used. The economic impact multipliers are based on the Mining Association of British Columbia's *Economic Impact Analysis* for government revenues. Economic multipliers for direct and indirect effects of the mining industry were calculated. Multipliers were also further broken down between capital and operating expenditures.

Outward transportation, exploration and development, environmental control, and public interest and other expenditure multipliers are not included in the calculations of government revenue impacts.

CORPORATE INCOME TAX

Provincial corporate income tax impacts from the mine are calculated using the provincial revenue multipliers. A provincial revenue impact is first calculated, and then broken down between corporate income tax, personal income tax, and sales taxes. Based on Government of British Columbia 2011 estimates, it was calculated that corporate income represents 12 percent of the sum of the three taxes.

It was assumed that there would be no direct corporate income tax paid by the mine until after cumulative cash flow (running sum of all operating costs, capital costs, and revenues) was positive. Indirect corporate income tax from other businesses in the region was assumed to be positive from the beginning of construction.

PERSONAL INCOME TAX

Direct personal income tax was modelled using employment numbers from a typical mineral mine's Technical Report and Feasibility Study. Direct Employment was broken down into two groups: mine employees and construction employees.

Wages for the mine's process plant manpower requirements and general and administration staff were found in the technical report and feasibility study. Wages for construction employees were based on a 2009 BC survey of wages under National Occupations Classifications: (1) trades, (2) transport and equipment operators, and (3) related occupations. These wages were inflated to 2012 dollars.

Indirect employment numbers were calculated using economic multiplier ratios for mine employment. Wages are assumed to be the average of mine or construction employees.

Provincial personal income tax was modeled using 2011 tax rates. It was assumed that non-taxable deductions from income would equal 5 percent of total income. Personal income tax per employee was assumed to increase by 2.5 percent per year.

SALES TAX

Provincial sales tax impacts from the mine are calculated using the provincial revenue multipliers. A provincial revenue impact is first calculated and then is broken down between corporate income tax, personal income tax, and sales taxes. Based on Government of British Columbia estimates, it was calculated that sales tax represents 44 percent of the sum of the three taxes.

MINERAL TAX

The mineral tax estimate was made using provincial mineral tax rates and extensive use of a typical mineral mine's technical report and feasibility study's cash-flow estimates. The provincial mineral tax is a two-part tax, including a net current proceeds tax and a net revenues tax. A net current proceeds tax of 2 percent was applied to cash flow excluding capital until the cumulative cash flow was positive and tax credits were used.

After invested capital is paid for and tax credits are exhausted, a 13 percent net revenues tax is applied to cash flow including both operating and capital costs.

MINERAL LEASE

The mineral lease revenue is calculated at $10 per hectare based on the current lease rate set by the provincial government. The typical mine used is estimated to be 42,636 hectares in size. It was assumed that every ten years the lease amount would increase by 5 percent.

Supplement 14B

CLOSING THE INSTITUTIONAL GAP: THE ROLE OF THE FIRST NATIONS TAX COMMISSION (FNTC) IN SUPPORTING TAXATION AND INFRASTRUCTURE

First Nation governing institutions were replaced with the Indian Act (1876) and the Department of Indian Affairs and its later configurations. The result has been the creation of a large legal, administrative, and institutional gap between First Nations and local and provincial governments. An indicator of this gap is the number of provincial and local laws governing property rights, public services, fiscal relations, land development, and environmental management, compared to the number governing such matters on First Nation lands.

Some First Nations have been working to close this gap by creating legislation and supporting local, regional, and national institutions of First Nations governance. One such institution is the First Nations Tax Commission. Originally started as the Indian Taxation Advisory Board in 1989, it became the FNTC after the 2005 First Nations Fiscal Management Act (FMA).

The mission of the FNTC is to maximize the benefit of First Nation tax systems to First Nations and their taxpayers. The FNTC helps First Nations to develop, implement, and administer tax systems that deliver quality services and infrastructure at a fair rate of taxation.

In 1989 it was estimated that only twenty First Nations could establish tax systems. This was wrong: there are now over 170 First Nation tax systems in all provinces and territories except Prince Edward Island. It is estimated that about $1 billion in First Nation tax revenues have been generated since 1990. These revenues have been used to provide local services and build a significant amount of community (gyms, government offices, health centres) and economic (roads, water, and sewer) infrastructure.

To demonstrate how such an institutional framework could support an Aboriginal resource tax, it is instructive to review the FNTC. The FNTC approach is to support First Nation governments using a continuum that begins with quality research. This

research informs the design of legislation and regulations and eventually contributes to sound policies and standards that form the basis for laws. Research also informs the curriculum under which the FNTC trains tax administrators. Figure 14.8 also summarizes some of the work completed by the FNTC in each element of the continuum.

It is beyond the scope of this paper to discuss all the components of the FNTC and First Nation taxation institutional and regulatory framework but three elements are particularly important:

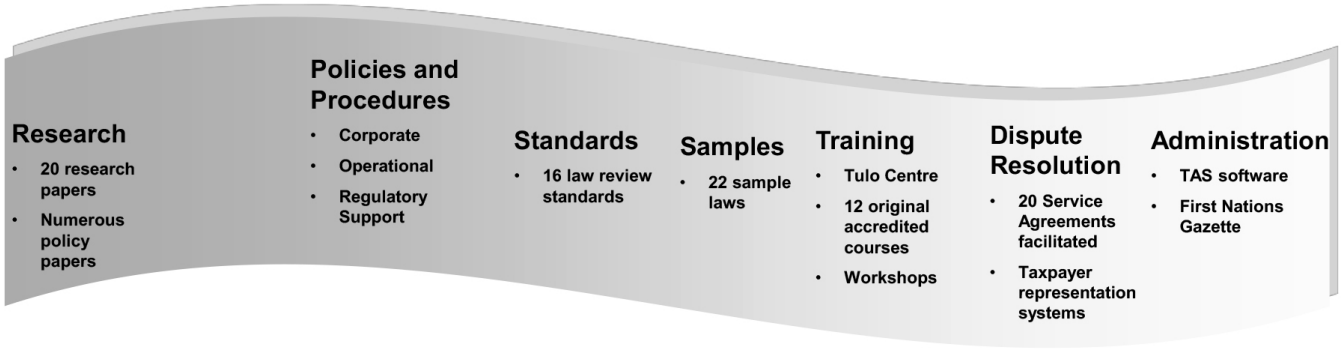
Standardized regulatory framework. The FNTC provides a series of sixteen law review standards for First Nation tax administrations and reviews their tax laws to ensure compliance. The FNTC also provides a series of twenty-two sample First Nation laws that meet the law review standards for tax enforcement, assessment, expenditure, rates, development cost charges, infrastructure financing, and business activity taxes. The result is that the First Nation tax system is highly standardized, which reduces transaction costs for investors and improves First Nation credit ratings for potential borrowing. The FNTC also provides the online *First Nations Gazette*, which is the largest repository of First Nation laws in the country.

Accredited training and capacity support. Standardization facilitates training and system development. The FNTC has developed the first university-accredited certificates in First Nation Tax Administration and First Nation Applied Economics with the Tulo Centre of Indigenous Economics and Thompson Rivers University. The twelve original courses in these certificate programs have been taken by over one hundred First Nation students and administrative staff. The result has been an increase in tax laws and a greater focus on the fiscal benefits from land development. In addition to these certificate programs, the FNTC has developed cloud-based tax administration software (TAS), which is used by many First Nation tax systems to collect and enforce their taxes.

Infrastructure planning and financing. The fiscal benefits generated by taxation are amplified when these revenues are reinvested into the development, maintenance, repair, and replacement of business-grade infrastructure. This investment in infrastructure enables further investment that increases tax revenues.

The FNTC supports the process of continuous improvement by supporting infrastructure development and financing. The FNTC is working to increase First Nation revenue options and then provide a framework that supports long-term financing and the development of whole infrastructure systems where revenues are set aside to maintain the stock of infrastructure. With this in mind, the FNTC requires infrastructure plans to be integrated with medium-term fiscal plans. The FNTC also encourages First Nations to use the full range of infrastructure options, which includes borrowing, development cost charges, local improvement taxes, property taxes, business activity taxes, and joint development with adjacent communities using comprehensive service agreements.

Figure 14.8: Summary of Projects Undertaken by FNTC



15

FEDERALISM AND TRANSPORTATION INFRASTRUCTURE: THE US EXPERIENCE

Martin Horak and Gabriel Eidelman

The United States, like Canada, is a highly decentralized federation in which subnational governments enjoy wide-ranging policy autonomy. With respect to infrastructure, the two countries share broadly similar geographies and developmental histories, resulting in similar settlement patterns and analogous infrastructure demands. They also share a dominant political discourse about the issue—a national "crisis"—that calls for increased federal aid. Yet the similarities end there, both in terms of institutional structure and the historical role of the federal government in infrastructure funding and decision making.

In contrast to Canada, political authority in the United States is intentionally fragmented and diffuse within each level of government. At the federal level, the separation of powers between executive and legislative branches, together with a lack of party discipline in Congress, creates a system with many sources of authority and veto points that allows local interests a voice in national policy processes. State-level governing institutions essentially replicate this model. At the local level, fragmentation takes a rather different form. The United States has 90,056 local governments, including counties, municipalities, townships, and special districts (US Census Bureau 2012). On a per capita basis, that is nearly three times more local authorities than in Canada. As in Canada, local governments in the United States hold no formal constitutional standing. Yet there is a strong tradition of local autonomy, enshrined in various state constitutions and city charters as the principle of Home Rule. The result is a complex, multilevel system of infrastructure governance that includes myriad political and administrative actors. Federal policies strongly shape the scope of state and local infrastructure programs. But decisions are largely arrived at through a bottom-up process, whereby political

coalition-building at the state and local levels determines which projects reach the federal bureaucratic filter.

This chapter presents a historical overview of public infrastructure spending in the United States, with a particular emphasis on surface transportation infrastructure (highways, roads, transit, and rail). What our investigation reveals is a system shaped by sixty years of extensive and systematic federal involvement, which stands in stark contrast to the Canadian experience. We begin by reviewing general trends in public infrastructure financing. Next, we explore the current and historical role of the federal government in transportation policy and funding. We then examine the dynamics of infrastructure decision making at the state and local levels. Finally, we offer some comparative conclusions about the distinctive features of the American versus the Canadian federal system.

Public Infrastructure Spending in the United States

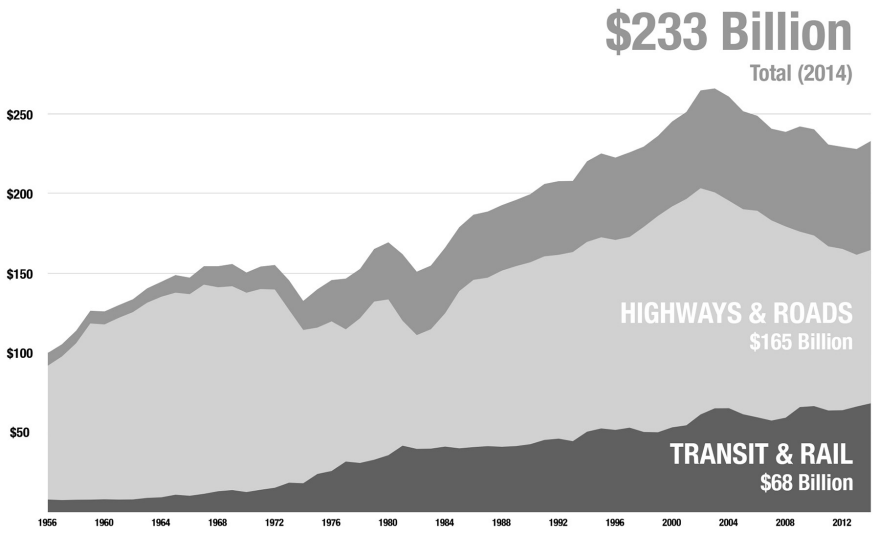
The complexity of American federalism makes it difficult to track infrastructure investments across all classes of public works. The National Association of Manufacturers estimates that combined public and private spending on new infrastructure in the year 2012 totalled $291 billion (Werling and Horst 2014, Table 1-1). Approximately $181 billion was spent by federal, state, and local governments, compared to approximately $110 billion by the private sector—a roughly 60–40 split. According to the association, the majority of all public investment in new infrastructure ($127 billion) goes toward transportation: highways, streets, passenger rail and mass transit systems, aviation facilities, ports, and inland waterways. The remainder pays for drinking water systems and wastewater plants, and to a minor extent, energy supply and elements of the power grid. The private sector pays for freight rail, oil and gas pipelines, electric power facilities, and virtually all communications systems and networks.[1]

The US Congressional Budget Office (CBO) regularly publishes reports on public infrastructure spending focused specifically on transportation and water infrastructure. These numbers include both spending on new infrastructure and spending on maintenance, operation, and repair. The CBO's most recent report concluded that combined federal, state, and local expenditures on transportation and water infrastructure totalled $416 billion in 2014 (Congressional Budget Office 2015). More than half of this figure ($233 billion) went to what the CBO defines as surface transportation—highways, roads, transit, and rail.

In absolute terms, public spending on surface transportation has grown steadily over the past sixty years (Figure 15.1). Between 1956 and 2014, spending increased

1. These data do not account for public-private partnerships or other arrangements that blur the line between public and private infrastructure spending.

Figure 15.1: Transportation Infrastructure Spending, 1956–2014

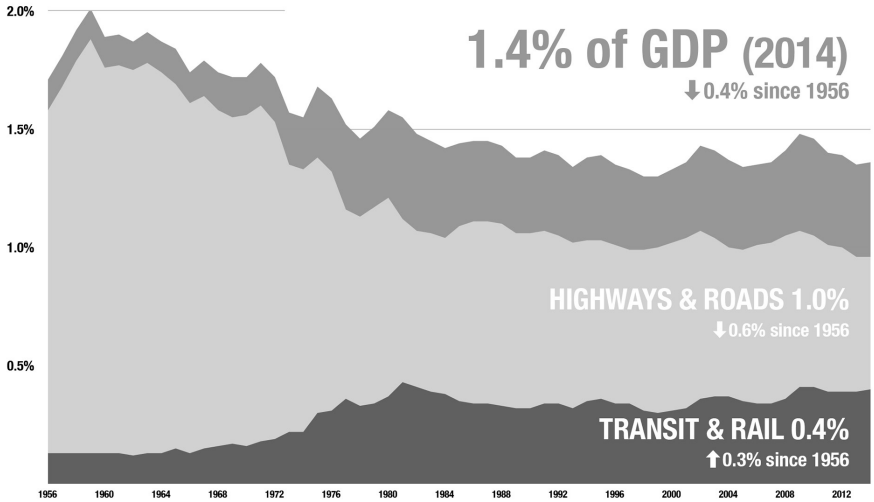


Source: Congressional Budget Office (2015). Adjusted for inflation (2014 dollars). Includes all government spending on highways, roads, transit, and rail.

from $100 billion to $233 billion per year in real (2014) dollars, an average annual increase of 2.3 percent. Spending on highways and roads rose from $92 billion to $165 billion, and spending on transit and rail increased exponentially from $8 billion to $68 billion. However, as a share of GDP, relative spending actually declined over the same period.

Overall, public spending on surface transportation accounted for 1.4 percent of US GDP in 2014—down 0.4 percent since 1956 (Figure 15.2). Spending on highways and roads, specifically, declined from 1 percent to 0.6 percent of GDP, offset by a 0.3 percent increase in spending on transit and rail. Of particular note is the medium-term trend. Since the 1980s, spending across all categories of surface transportation as a share of GDP has remained remarkably constant, both for highways and roads and for transit and rail. From the mid-1950s until President Reagan's first term in office in the early 1980s, there was a considerable decline in spending on highways and roads as a share of national output, from a peak of 1.9 percent in 1959, down to 1.1 percent in 1983. In contrast, funding for transit and rail rose from virtually zero—a rounding error—in 1956 to 0.4 percent in 1981. After 1980, however, relative spending levels stabilized, moving less than +/- 0.1 percent.

Figure 15.2: Transportation Infrastructure Spending by GDP, 1956–2014



Source: Congressional Budget Office (2015). Adjusted for inflation (2014 dollars).

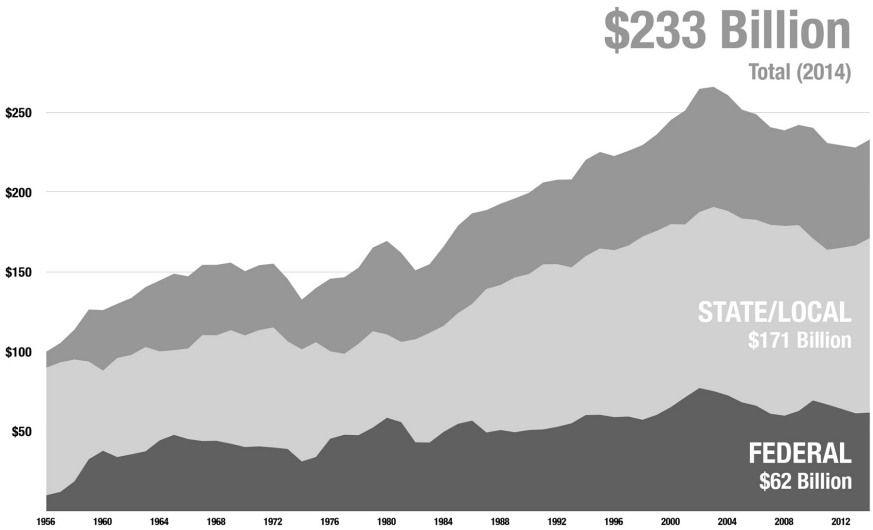
Federal Transportation Spending: Sources and Flows

In comparison to its Canadian counterpart, the US federal government has consistently played a large role in the provision of transportation infrastructure.[2] Currently, the federal government provides 27 percent ($62 billion) of all public funding for transportation infrastructure in the United States (Pew Charitable Trusts 2014). This is consistent with the historical norm; since 1960, the federal share of infrastructure spending has generally hovered between 25 and 35 percent (Figure 15.3).

The federal government does not make many *direct* investments in transportation infrastructure (Figure 15.4). Instead, 98 percent of all federal funding is transferred to states and local governments in the form of "categorical" grants—what in Canada are called conditional transfers. Of this total, 93 percent of federal funds are further categorized as "formula" grants, meaning that disbursements to other levels of government are calculated based on preset criteria and accounting procedures. Formula grants are authorized via periodic congressional acts, and are administered by a large but centralized bureaucracy, dominated by the Department of Transportation

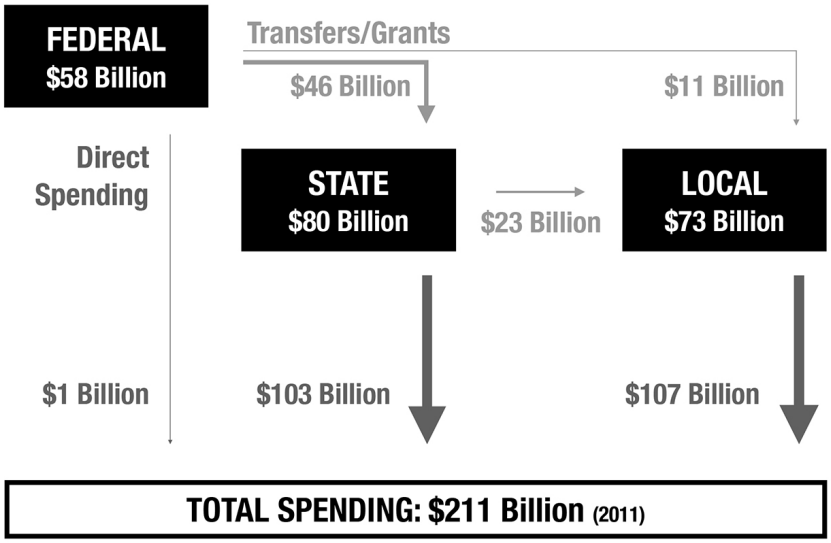
2. From this point on in the chapter, we use the term "transportation" to refer specifically to surface transportation as defined above. Our discussion does not include public policy and spending on air and water transportation systems.

Figure 15.3: Transportation Infrastructure Spending by Level of Government, 1956–2014



Note: The CBO does not disaggregate state and local funding.
Source: Congressional Budget Office (2015). Adjusted for inflation (2014 dollars).

Figure 15.4: Transportation Funding Flows between Levels of Government



Source: Pew Charitable Trusts (2014, 5).

and its subsidiary agencies—notably, the Federal Highway Administration and the Federal Transit Administration.

The most important formula grant is the Highway Trust Fund, bankrolled by the federal gas tax. The Trust Fund accounts for roughly two-thirds of federal spending, and includes money for both highways and public transit. Trust Fund money is distributed to states (not local governments) based on a complicated formula that incorporates a number of variables, including population, population density, miles of highway lanes, vehicle and bus passenger miles travelled, and amounts of federal gas and vehicle taxes collected in each state. State governments determine—in consultation with local governments—how the money gets spent, but are subject to a complex set of federal rules and policy guidelines.

The remaining 7 percent of federal transfers that are not formula-based flow through "competitive" project grants. Competitive grants can be distributed directly to local governments, but are conditional on approvals from the federal Department of Transportation, compliance with local and state-wide transportation plans, and matching funds from state and/or local governments (anywhere from 10 to 50 percent of project costs).[3]

Shaping the System: Six Decades of Federal Transportation Policy

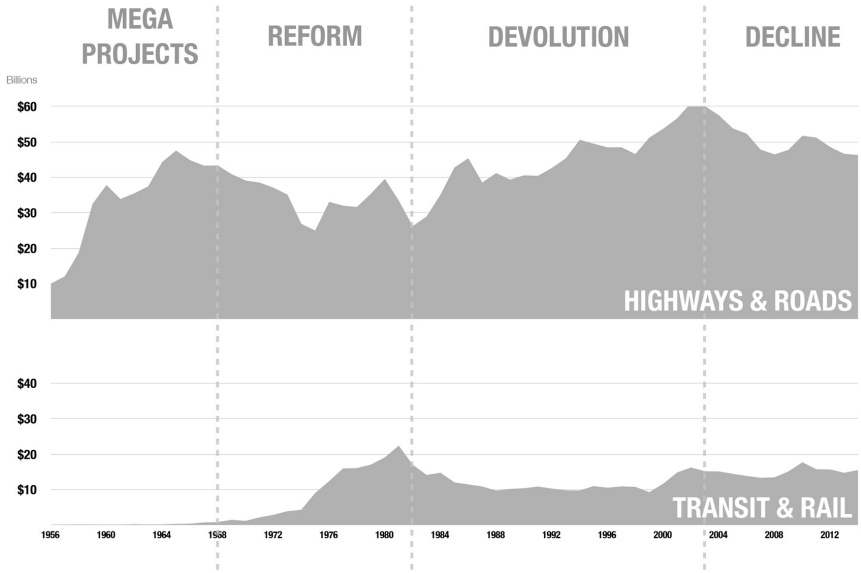
Sixty years of federal investment in transportation infrastructure has established a durable set of political and administrative institutions at every level of government. Building on the work of Altshuler and Luberoff (2003), we delineate four eras of federal transportation policy: the megaprojects era, the reform era, the devolution era, and the era of decline (Figure 15.5).

The Megaprojects Era: 1956–1968

The foundations of the contemporary transportation governance system were laid with the passage of the 1956 Federal-Aid Highway Act. Spurred by regional development concerns, auto industry lobbying, and national security preoccupations, the 1956 act authorized the construction of a 40,000-mile toll-free interstate highway system connecting the nation's urban centres, paid for by fuel taxes and excise taxes on the sale of trucks, trailers, and truck tires that went into a Highway Trust Fund. Funding for highways jumped from $10 billion in 1956 to $48 billion

3. These figures do not include various other indirect federal supports for infrastructure, including tax exemptions on interest earned on state and municipal bonds, direct loans, or loan guarantee programs.

Figure 15.5: Federal Spending on Transportation Infrastructure, 1956–2014



Source: Congressional Budget Office (2015). Adjusted for inflation (2014 dollars).

in 1965—a fourfold increase in less than a decade. While the federal government retained control over the shape of the emerging interstate system, funds flowed through state governments, bolstering the significance of state-level transportation departments (Goetz 2007, 124). In 1966, the federal government created its own Department of Transportation to administer the interstate program. Within a few short years, many of the key institutional building blocks of the contemporary system were thus put in place.

While the main objective of the interstate program was to facilitate efficient inter-urban transportation, it also had a profound impact on transportation infrastructure within urban areas. Growing racial tensions and central city decline stimulated federal investments in "urban renewal" programs under the Johnson administration in the early 1960s, and interstate funds became a powerful lever for the advancement of this agenda. Working through new federally mandated Metropolitan Planning Organizations (MPOs), elites in many large cities developed ambitious new urban transportation agendas. Federally funded urban expressways cut through dozens of American cities, fuelling unprecedented suburbanization and auto-oriented urban growth, but also massive displacement within city centres.

The Reform Era: 1968–1982

By the late 1960s, as the interstate system neared completion, the inner-city disruption caused by urban expressway projects led to widespread anti-freeway protests and community resistance. As a result, the federal government reduced spending on highways and instead invested in mass transit. From 1968 to 1982, federal highway funding dropped by 40 percent, while transit funding skyrocketed from just under $1 billion in 1968 to a peak of $19 billion in 1980—a growth rate, in percentage terms, higher than any other federal budget item over the same period.

The jump in transit funding was in part the result of a clever political coalition between highway and transit lobbyists, forged in the wake of the first round of highway spending cuts in the mid-1970s. By creating a "highway-transit alliance," highway advocates insulated themselves from political resistance by promising that every investment in highways would also benefit transit, while transit advocates benefited by associating themselves with one the richest lobbies in Washington. The result was the creation in 1982 of a "mass transit account" within the Highway Trust Fund, which secured roughly 20 cents of every highway dollar for transit investment. The coalition between highway and transit advocates has endured, helping to ensure that the percentage of federal transportation funds flowing to transit projects far outweighs the 3 percent of Americans who regularly use public transit (US Department of Transportation 2009, Table 7).

The Devolution Era: 1982–2003

From the 1980s until the early 2000s, the federal government began shifting responsibility for transportation policy onto state and local governments, at least in principle. In practice, it also instituted new planning, environmental, and public consultation requirements that undermined state and local autonomy.[4] The 1991 Intermodal Surface Transportation Efficiency Act (ISTEA), for example, dictated that no federal Highway Trust Fund money could be spent without state and local review. The legislation required that federally funded projects conform to state-wide transportation plans, and in urban areas, regional plans developed by Metropolitan Planning Organizations (MPOs; Goetz 2007, 128). Yet ISTEA also enshrined a highly prescriptive form of devolution that ensured conformity with evolving federal policy objectives. The legislation outlined new standards for intergovernmental collaboration, environmental review, and community consultation—what Altshuler

4. Along with funding decreases, these developments led some scholars to describe the transfer of authority to states during the era of devolution as relatively superficial—a "de facto" rather than "substantive" devolution (Kincaid 1999; Vogel 2007).

and Luberoff (2003) call "do no harm" policies—that made transportation projects more difficult to develop and more expensive to execute.

Surprisingly, federal highway funding increased steadily during the devolution period, due, at least in part, to the growth of Congressional earmarks. While the bulk of federal transportation funding is allocated via the Highway Trust Fund's merit-based criteria, the rest is considered discretionary funding, distributed by Congress without any justified planning rationale. ISTEA's successor legislation, the 1998 Transportation Equity Act for the 21st Century (TEA-21), included over 1,800 earmarked projects worth $9.4 billion (Altshuler and Luberoff 2003, 117). The subsequent 2005 Safe, Accountable, Flexible, Efficient Transportation Equity Act (SAFETEA-LU) included over 6,300 earmarks worth upwards of $23 billion (Office of Management and Budget 2016). Astonishingly, 99 percent of these projects were never subject to administrative or planning review (US Department of Transportation 2007).

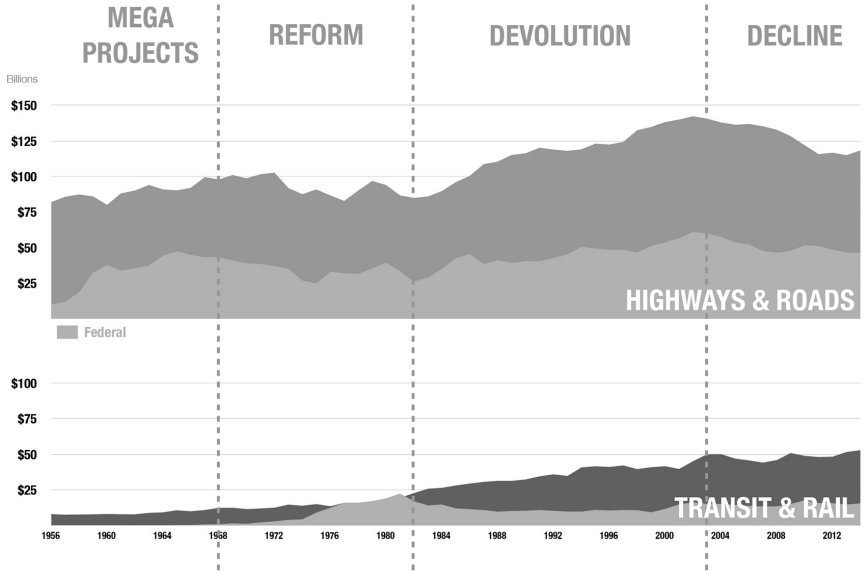
The Era of Decline: 2003–Present

Around 2003, federal highway and transit funding (and indeed, almost all categories of public infrastructure spending) began to contract significantly. Although in nominal figures infrastructure funding increased between 2003 and 2014, in real terms combined federal spending actually declined by 18 percent, due to a spike in the cost of construction materials and a long-term decline in federal gas tax revenues. Revenues have fallen by over 30 percent since their peak, due to declining auto use and the fact that the gas tax has remained at 18.4 cents per gallon since 1993. As a result, the Highway Trust Fund has reported annual deficits for more than a decade, with a long-term shortfall expected to reach $162 billion by 2024 (Congressional Budget Office 2014). Congress has usually opted to cover shortages from "general funds"—essentially, replacing revenue from gas taxes with income taxes and other revenue streams—but the current political climate in Washington, highly averse to general tax increases, will make this practice increasingly difficult going forward. This has led several academics and policy analysts to claim that the system is in crisis, while proposing various reforms such as the establishment of a federal "infrastructure bank" (Galston and Davis 2012). As of 2016, no such reforms appear on the political horizon.

State and Local Decision Making in a Complex System

Except for a brief period in the late 1970s and early 1980s, state and local funding for transportation infrastructure has consistently outweighed federal investment (Figure 15.6). The steady decline in real levels of federal funding since 2003

Figure 15.6: State and Local Spending on Transportation Infrastructure, 1956–2014

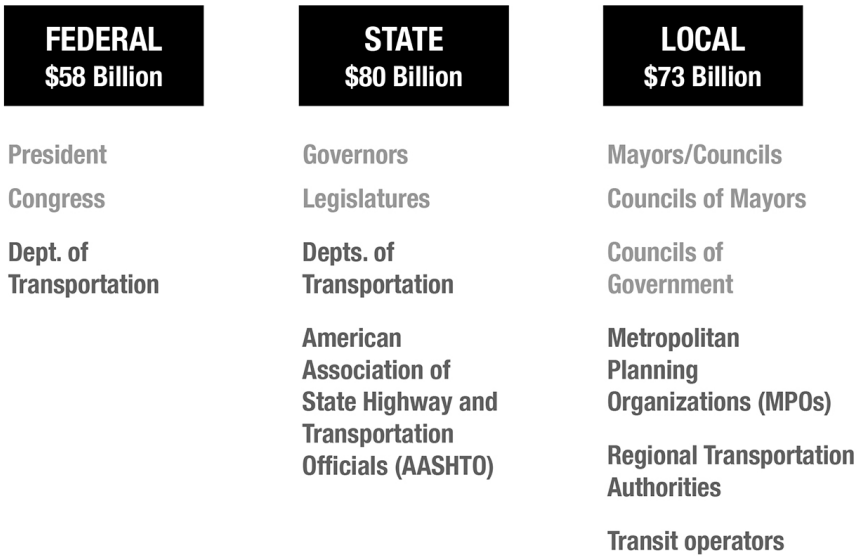


Source: Congressional Budget Office 2015. Adjusted for inflation (2014 dollars).

has shifted even more of the fiscal burden onto states and local governments. Transportation now represents the fifth-largest category of state expenditures and the third-largest local expenditure, behind K–12 education and public safety (Pew Charitable Trusts 2014, 4).

Generally speaking, most state dollars go toward highways and roads, whereas transit projects are led by local governments. The exact share of state spending varies widely, but it is typically lower in areas with large urban populations. In Montana, for instance, 55 percent of transportation funding came from the state, whereas in New York the state contributed only 15 percent of transportation funding (ibid., 1). Spending on highways and roads, in particular, usually tracks federal spending patterns. Most states, for instance, spent heavily on highway megaprojects in the 1950s and '60s and, more recently, have seen real spending decline post-2003, in the "era of decline." Decisions are also influenced by the specific structure of federal transfer programs. Federal *project* grants, for instance, typically require matching funds from state and local partners, thus encouraging increased state and local spending. Conversely, federal *formula* grants, such as the Highway Trust Fund, can have the opposite effect, discouraging state and local investment (Schwartz 2007; US Government Accountability Office 2004).

Figure 15.7: Government Actors Involved in Transportation Infrastructure Decision Making



Source: Compiled by authors.

Local decision making is defined by fragmentation. Most US cities are divided into dozens of local government units, so metropolitan-scale transportation projects must consider the interests of multiple mayors, councils, and coordinating bodies (Figure 15.7). Relevant institutions typically involve, at a minimum, a regional Council of Governments that hammers out policy priorities;[5] a regional transportation authority that develops and implements regional transportation plans; and a Metropolitan Planning Organization (MPO) that coordinates regional land use and transportation plans such that they are eligible for federal funding. It is not uncommon for residents of major metropolitan areas to be served by five or more layers of local planning authorities. In some city-regions, these authorities manage to work together closely, effectively integrating transportation plans and policies; in others, though, political fissures lead to disjointed policies and programs.

The central obstacle to regional coordination is nearly always how to reconcile the needs and demands of the central city versus suburban interests. While in principle

5. Policy discussions may also extend to regional and national councils of mayors, such as Metro Chicago's Metropolitan Mayors Caucus, or the Minneapolis Regional Council of Mayors, or the nation-wide US Conference of Mayors.

MPOs might serve as a strong institutional fulcrum for consensus-building, most are dominated by representatives of individual municipalities and are not strong policy actors in their own right. Rather, they tend to aggregate local and regional land use and transportation plans to fit federal funding criteria (Wolf and Farquhar 2005). Even if the city-suburban divide is bridged, transportation projects still require robust political campaigning. In response to fiscal constraints on state budgets and local aversion to imposed taxes, forty-two states now require that tax increases for transit infrastructure must be directly approved by voters through ballot initiatives and referenda (Pagano and Perry 2008, 25). The history of these votes is mixed. Since 2008, local ballot measures for transit have been approved in two dozen large city-regions. But the list of referendum losses is just as long, including Houston, Atlanta, St. Louis, and Miami (see Center for Transportation Excellence 2016).

One recent example from Denver, Colorado, illustrates the political and administrative groundwork that goes into any major transit project.[6] Denver has a population of 600,000 in the city proper, and 2.6 million across the metropolitan region, governed by ten counties and over eighty municipalities. In the early 2000s, a consensus emerged that new transportation infrastructure—specifically, transit infrastructure—was sorely needed. The Denver Regional Transportation District (RTD), a regional transportation authority whose mandate is to develop and operate the region's transportation services, proposed the construction of FasTracks, a $6 billion plan for 122 miles of commuter rail, light rail, and bus rapid-transit lines currently under construction.

To move ahead with FasTracks, RTD officials had to clear three daunting political and administrative hurdles. First, RTD board members, who are directly elected by District residents, had to sign off on the idea. Second, the project required administrative approval from the Denver Regional Council of Governments (DRCOG), whose members represent nine counties and forty-six municipalities, and which serves as the region's Metropolitan Planning Organization. Finally, to pay for the scheme, RTD was required to initiate a ballot measure, sponsored by the Denver Chamber of Commerce, asking voters to approve a 0.4 percent regional sales tax. The measure required state-level approval before being placed on the ballot—approval that the Colorado governor initially withheld for fear of a negative impact on highway funding. Eventually, the ballot measure passed, with support from the Metro Mayors Caucus, yet another committee of mayors in the region.[7] Only then did FasTracks become eligible for federal funding through the Federal Transit Administration's "New Start" program.

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6. The discussion here is based on a detailed case account developed in Jonas, Goetz, and Bhattacharjee (2014).

7. The ballot measure passed by a healthy 58 to 42 percent margin—incidentally, the exact opposite result of a similar vote in 1997.

COMPARATIVE CONCLUSIONS

Despite basic institutional similarities between the Canadian and American federal systems, the process of public infrastructure investment in the two countries are quite distinct. A comprehensive list of differences is beyond the scope of this chapter. Instead, our analysis highlights five key points of comparison regarding the extent of federal involvement, and the character of decision making processes at all levels of government, as it relates to transportation infrastructure.

First, the American federal government plays a much larger role in transportation infrastructure funding than in Canada. In 2014, the US federal government accounted for 27 percent of all public spending on surface transportation. By contrast, in 2008–09, the analogous Canadian figure was only 6 percent.[8] Not only is federal funding in the United States greater but it has also been in place for much longer. As we saw above, the federal share of US transportation infrastructure spending has remained relatively steady over the past sixty years; by contrast, the Canadian federal government has not been a notable source of funding until the creation of federal infrastructure funds in the 1990s.

Second, while the vast majority of federal transportation funding in both the United States and Canada takes the form of intergovernmental transfers, rather than direct spending, the connection between revenues and expenditures is much tighter in the United States. As we have seen, most American federal transportation funds come from gas tax revenues, which are deposited in the Highway Trust Fund and used exclusively to fund transportation infrastructure. In Canada, the story is rather different. Of the approximately $5 billion currently collected in federal gas taxes each year, only $2 billion (40 percent) currently flows to the Gas Tax Fund, with the rest blended into general revenues. On the expenditure side, Gas Tax Fund disbursements account for only a small share of federal transportation spending, and support local infrastructure development of all kinds, not just transportation infrastructure.

Third, the historical evolution of federal transportation funding in the United States demonstrates a divergence in both national policy goals and institutional frameworks. The contemporary American system is historically grounded in federal designs for the interstate highway and urban renewal programs of the 1950s and '60s. Although the goals shifted over time, with a new emphasis on mass transit and, later, inter-modal transportation systems, transportation infrastructure has consistently been considered by federal authorities to be a national policy priority. The result is a well-established bureaucratic system of federal transportation governance,

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8. Calculated from raw data obtained via direct communication with Transport Canada (2012, Table G5). There is some indication that this proportion has increased since 2009, but the absence of local government data prevents precise calculations. We estimate that the figure remains below 10 percent as of 2015.

in which most federal funds (with the notable exception of Congressional earmarks) are administered by the Department of Transportation and allocated to states according to complex formulae, and individual projects are approved on the basis of formal standards and regulations.

By contrast, the Canadian federal government's much briefer involvement in transportation infrastructure funding has been largely devoid of clear policy objectives. Apart from the Paul Martin's short-lived New Deal for Cities and Communities, successive governments have shown little interest in developing a robust infrastructure agenda, let alone a clear set of goals that might spur the development of a national transportation infrastructure strategy. Not surprisingly, federal policy capacity in the infrastructure sector therefore remains low. Funding decisions are either devolved to provincial and local governments, or—as is often the case with large, nationally significant projects—based on political expediency, rather than established policy criteria.

Fourth, the American federal government's long-standing involvement in transportation infrastructure has shaped state and local institutions and decision processes in ways that have no parallel in Canada. The structure and functioning of state-level Departments of Transportation, the very existence of Metropolitan Planning Organizations, and the extensive public consultation and environmental review procedures required to receive project approvals are all the result of systematic federal intervention in the field. In only a few rare exceptions, such as the Harper government's short-lived requirement that federal contributions to large infrastructure projects be assessed for their public-private partnership potential, has Canada's federal government imposed onerous restrictions on provincial or local spending decisions.

Finally, the extreme degree of government fragmentation in the United States, particularly at the local level, combined with the impacts of devolution and recent declines in federal spending, means that proposed infrastructure projects can only be achieved through a difficult, bottom-up process of coalition-building, and in many cases, direct approval by voters. While political and administrative negotiations in Canada are often complex, the number of veto points present in the typical US case is beyond anything imaginable in a Canadian setting.

What can Canadian policy makers learn from these comparative conclusions? At the very least, the US case should serve as a cautionary tale for would-be reformers of the Canadian system of public infrastructure investment. As Altshuler and Luberoff (2003) argue, the combination of burdensome federal funding criteria, the ad-hoc nature of Congressional decision making, and the practical challenges of political coalition building and administrative coordination at the local level most often lead to policy failures. Moreover, many elements of the American system are products of deeply rooted institutional structures, and as such, cannot be easily transferred to the Canadian context. For example, due to the separation of powers between executive and legislative branches, and features of weak party discipline, once a federal policy direction is set in the United States, it is difficult to undo. As

a result, infrastructure decision making in the United States is slower, and policies and funding commitments more durable, than we can reasonably expect them to be in Canada.

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16

IS THE TEACHING OF FEDERALISM DEAD OR ALIVE IN CANADA AND THE UNITED STATES?

Richard L. Cole and John Kincaid[1]

Federalism is a fundamental principle of both Canadian and American government and politics. The United States is the oldest modern federation; Canada is the sixth oldest. Almost 150 years ago, John A. Macdonald, Canada's first prime minister, declared that in forming the Canadian federation, "we have hit upon the happy medium … and … formed a scheme of government which … [gives] us the strength of a legislative union and the sectional freedom of a federal union, with protection to local interests" (1865). Expressing a related sentiment, American President Woodrow Wilson observed that "the relation of the States to the Federal Government is the cardinal question of our constitutional system" (1908).

Accordingly, virtually every introductory Canadian and American government and politics textbook includes a chapter on federalism. Variously titled "The Federal System" (Cochrane, Blidook, and Dyck 2017), "Federalism: Dividing Governmental Power" (Dye and Gaddie 2016), "The Dynamics of Canadian Federalism" (Bickerton and Gagnon 2014), or simply "Federalism" (Brooks 2016;

1. The authors thank Dariya Kudabaeva, graduate student at the University of Texas at Arlington, for her assistance with data collection; André Juneau, Institute of Intergovernmental Relations at Queen's University, for an initial list of Canadian federalism scholars; and Douglas M. Brown, St. Francis Xavier University, Patrick Fafard, University of Ottawa, and the late Ronald L. Watts, Queen's University, for helpful comments on our questionnaire. We also thank Patrick Fafard; Alain-G. Gagnon, Université du Québec à Montréal; Thomas O. Hueglin, Wilfrid Laurier University; and André Lecours, University of Ottawa, for very helpful comments on this article, especially the concluding discussion. None of these individuals is responsible for any deficiencies in our work.

Wilson, Dilulio, and Bose 2014), these chapters invariably present federalism as foundational to students' understanding of each country's political system.

But beyond the attention paid to the topic in introductory texts, how much attention is given to federalism, intergovernmental relations, multilevel government, multilevel governance, and related topics in upper-division government and politics courses? Further, what topics are covered in those upper-division courses, how do the approaches to offering these courses differ between Canadian and American faculties and universities, how interested are students in enrolling in such courses, and how valuable do faculty colleagues regard these courses as being?

Our survey of political science department heads and federalism scholars in Canada and the United States found that, among other things, undergraduate and graduate courses on federalism and/or intergovernmental relations and interest in offering such courses are prevalent in both countries but that such courses are taught more often in Canadian than in US institutions. In both countries, though, courses on Canadian and American federalism are more common than courses on comparative federalism. Canadian faculty reported notably higher levels of student interest than US faculty in undergraduate federalism courses and were far more likely than their US counterparts to believe that such courses are considered "very valuable" by their department colleagues. In both countries, "policy issues," "vertical federalism," "theories," "fiscal," "political," "historical," and "legal" topics receive substantial course coverage; less time is devoted to "IGR administration," "comparative," and "interlocal."

RATIONALE AND PREVIOUS RESEARCH

As students of federalism who also teach courses on federalism, we undertook this research to satisfy our curiosity about the state of federalism teaching and to respond to concerns expressed by many of our US federalism colleagues that teaching federalism had declined and is no longer valued in academe. It is not unusual for political scientists to survey the profession's pedagogical practices. There also is a void in the literature that directly addresses the teaching of federalism. Through this research, we hoped to uncover not only the frequency of courses offered on federalism but also core topics covered in those courses that might be useful to those who teach such courses as well as to junior colleagues thinking about teaching a federalism course.

For the United States, a study conducted forty-five years ago found only 23 percent of American political science departments offering courses specifically devoted to federalism or intergovernmental relations (IGR). That study concluded that federalism and intergovernmental relations were the "dark continent" of college and university political science teaching in the United States (Stenberg and Walker 1969). A study conducted in the mid-1970s found a growing "likelihood

of inclusion of intergovernmental relations related content in introductory political science courses at *larger* [American] universities and colleges" (Lovrich and Taylor 1978, emphasis in original). A more recent study, conducted by the authors of the present report, found an even higher proportion of American political science departments offering, or at least interested in offering, these courses today than was previously the case (Kincaid and Cole 2014). In a further study, we found that courses on federalism and/or intergovernmental relations are more prevalent in public administration than in political science; interest in teaching such courses is higher in public administration than in political science; and such courses are viewed as valuable by department colleagues in public administration (Kincaid and Cole 2016).

We are not aware of a comparable survey in Canada. A 1965 survey did not inquire about teaching or research on federalism but did point indirectly to attention to federalism by asking about leading political scientists (March and Jackson 1967). Canadian political scientists identified Robert MacGregor Dawson, J. A. Corry, and Alexander Brady as having made the greatest contributions to Canadian political science before 1945. Although federalism was not the central focus for all of these scholars, all gave some sympathetic attention to it. Dawson's *The Government of Canada* (1958) provided extensive coverage of federalism, including a chapter on "Dominion-Provincial Financial Relations." Corry and Henry J. Abraham devoted a chapter to federalism in their *Elements of Democratic Government* (1958). Peter H. Russell deemed Alexander Brady (e.g., 1959) to be "among the foremost Anglophone scholars of Canadian federalism of his day" (Leuprecht and Russell 2011: 21).

C. B. MacPherson, Norman Ward, John Meisel, Henry Mayo, James Eayrs, David Easton, and Donald Smiley were named as making the most important contributions to Canadian political science after 1945. This period reflects a maturation of Canadian political science and the rise of a more diverse profession. Ward, Mayo, Eayrs, and Easton were not attentive to federalism. MacPherson is perhaps best known for his 1962 book on possessive individualism; nonetheless, he co-edited *The Future of Canadian Federalism* (Crepeau and MacPherson 1965). Meisel (1995) was sometimes critical and skeptical of federalism. Richard Simeon described Donald Smiley "as one of Canada's leading students of federalism" (Simeon 2013).

In an earlier survey of American political scientists, respondents named Charles A. Beard, Edward S. Corwin, Robert A. Dahl, V.O. Key, Harold D. Lasswell, Charles Edward Merriam, Hans J. Morganthau, Herbert A. Simon, David B. Truman, and Leonard D. White as making the most important contributions to political science (Somit and Tanenhaus 1963, 938). In contrast to the general sympathy of Canadian political scientists toward federalism, as noted above, Leonard D. White is the only notable American political scientist who argued for strengthening the position of the states in the federal union (1953). Otherwise, as the authors of a leading 1950s textbook put it, "Many alarmists have been worried at the rapid expansion of federal

powers during the short expanse of our existence," but those fears have been "both consciously and unconsciously exaggerated" (Gosnell and Holland 1951, 44).

Beard, born in 1874, was a post–Civil War Hamiltonian nationalist (1935) and even edited and analyzed a version of *The Federalist* from this perspective (1948). Corwin (1913; 1950), who unsuccessfully sought an appointment to the US Supreme Court from President Franklin D. Roosevelt, was an ardent nationalist. Dahl (1983, 2001) was a centralist for whom federalism conflicted with his preference for majority rule. Merriam (1910, 1920), who also was born in 1874, was a post–Civil War nationalist. Truman (1951) was somewhat critical of federalism but mostly treated it as an inescapable facet of pluralism in the US political system. In his book on administrative decentralization in the US Department of Agriculture (1940), Truman noted that centralization was the actual operating norm. One of Key's earliest works (1937) was on grants-in-aid, but his later work did not focus on federalism. Lasswell, Morganthau, and Simon said little about federalism.

In summary, the notable political scientists mentioned in the Canadian survey more often focused on federalism and were generally favourable to federalism and accepting of it as a necessary balance of federal and provincial powers. More generally, "political support for a centralist vision simply did not exist" in Canada (Simeon and Robinson 1990, 53). The notable American political scientists paid less attention to federalism and were most often nationalists and centralists when they did address federalism.

More recent research in Canada has suggested a decline in the study of federalism there and a shift away from traditional federalism topics such as constitutional processes and Quebec sovereignty to such subjects as Aboriginals and the Charter of Rights and Freedoms, as well as declining student interest in traditional federalism topics (McIntosh 1997; Cameron and Krikorian 2002; Privy Council Office 2007). A more recent study concluded that the number of published studies on federalism in Canada is small; federalism studies are linked to current events and issues; there has been a decline of student, especially graduate student, interest in federalism; and scholarly research on federalism is less common in Quebec than in the rest of Canada (Fafard and Rocher 2009).

RESEARCH FOCUS

The focus of our study is on university- and college-level teaching of federalism-related courses in political science departments and other programs in Canada and the United States today. Is federalism given greater curricular attention in either of these two federations? Are students more interested in the topic in Canada or in the United States? Is the subject of federalism deemed more valuable to the degrees, curricula, and department colleagues in one country than in the other? To what extent, if at all, is the topic offered online, and what is the effect of online

offerings on student interest in learning about federalism and related issues? Do topics that are covered and the amount of attention given to particular topics vary in any meaningful ways between the countries?

We pursue these and other questions in full awareness and appreciation of the many differences in structures and arrangements of these two North American federations. With elements of asymmetry and comparatively decentralized legislative and administrative structures, Canadian federalism presents a picture distinctly different from the more symmetrical, centralized federal arrangements in the United States. The United States has no territorially based "national" community comparable to Quebec in Canada; Canada has a parliamentary form of government, whereas the executive and legislative functions are separated in the United States; and intergovernmental transfers as a percentage of provincial/state revenues are higher in the United States than in Canada. With a population in excess of 319 million, fifty states, and 90,005 units of local government, the United States encompasses a far larger citizenry and includes a far larger number of subnational governments than does Canada.

These and other important political, governmental, and socio-demographic differences between the two federations may affect the way that federalism-related topics are handled in colleges and universities and the importance accorded the topics in the two countries. In any case, we examine here both the similarities and differences in the teaching of federalism-related courses in Canada and the United States. We seek to determine the extent of such course offerings in the two federations and, in all cases, to compare the nature, structure, and content of federalism-related courses in American and Canadian universities.

METHODOLOGY

We conducted surveys in both the United States (2013) and Canada (2014) of political science department heads and political science faculty believed to be involved in federalism teaching and scholarship. The list of American political science department chairs (762) was provided to us by the American Political Science Association (APSA); the list of US faculty (319) was provided by the APSA's Section on Federalism and Intergovernmental Relations. The list of Canadian department heads (73) was provided to us by the Canadian Political Science Association. The list of Canadian scholars (180) was compiled independently by us from several sources.[2]

2. These included a list provided by the Institute of Intergovernmental Relations at Queen's University in Canada; a review of federalism authors appearing in the last ten volumes of Canada: State of the Federation; a review of federalism authors and articles appearing in the last ten years of issues of the Canadian Journal of Political Science; a review of all participants (recipients and applicants) of the Federalism and Federation Program

In all cases, respondents received an initial survey plus three follow-up requests for responses. Responses were received from 38.7 percent of US department heads, 58.9 percent of Canadian department heads, 48.9 percent of US faculty, and 42.8 percent of Canadian faculty. In none of the cases did we detect significant regional, institutional size, or type-of-degree bias in responses.

EXTENT OF CANADIAN AND AMERICAN COURSE OFFERINGS

Department chairs were asked whether undergraduate or graduate courses specifically devoted to [American or Canadian] federalism, intergovernmental relations, multilevel government, or multilevel governance are currently offered in their department and, if not, whether they were interested in offering such courses. Results are shown in Table 16.1.

A considerably higher proportion of Canadian than American universities offer such courses at both the undergraduate and graduate levels: 67.4 percent and 65.5 percent respectively in Canada. Roughly two-thirds of Canadian political science departments report offering such courses, compared with much smaller proportions of American departments. The difference is especially noticeable at the graduate level, where only 13.8 percent of chairs of US graduate-level departments report offering such courses. When asked if they have an interest in offering such courses in the future, the Canadian/American differential narrows noticeably, especially at the undergraduate level. Still, federalism-related courses clearly are considerably more prevalent in Canadian universities, at all levels, than is the case in the United States.

EXTENT OF COMPARATIVE FEDERALISM-RELATED COURSE OFFERINGS

Canadian and US department heads were also asked whether courses specifically devoted to comparative federalism/IGR and/or multilevel government/governance were offered by their departments at either the undergraduate or graduate levels. After all, the two leading textbooks on comparative federalism feature Canadian authors (Hueglin and Fenna 2015; Watts 2008). Results are displayed in Table 16.2.

Comparative federalism courses are much less popular in both American and Canadian institutions, as revealed in Table 16.2. But here too, significantly larger

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of the Canadian Social Science and Humanities Research Council; and a website scan of faculty in all Canadian colleges and universities listed as teaching or specializing in federalism and related fields.

Table 16.1: American and Canadian Federalism/IGR, Multilevel Government, Multilevel Governance Course Offerings

	American Undergraduate, % (N = 287)	Canadian Undergraduate, % (N = 43)	American Graduate, % (N = 106)	Canadian Graduate, & (N = 29)
Offering courses	36.1	67.4	13.8	65.5
Not offering courses, but interested in doing so	40.0	16.3	28.3	20.7
Totals (offering or interested in doing so)	76.1	86.2	42.1	83.7

Source: US survey conducted in 2013, Canadian survey conducted in 2014.

Table 16.2: Comparative Federalism/IGR, Multilevel Government, Multilevel Governance Course Offerings

	American Under-graduate, % (N = 287)	Canadian Under-graduate, % (N = 43)	American Graduate, % (N = 106)	Canadian Graduate, % (N = 29)
Offering courses	13.8	45.0	16.3	31.0
Not offering courses, but inter-ested in doing so	28.3	18.6	25.9	48.3
Totals (offering or interested in doing so)	42.1	63.6	42.2	79.3

Source: US survey conducted in 2013, Canadian survey conducted in 2014.

proportions of Canadian chairs report offering such courses than do their American counterparts, at both the undergraduate and graduate levels. Undergraduate comparative federalism courses were reported by 45.0 percent of Canadian chairs, and graduate courses were reported by 31.0 percent of those chairs. When asked which countries received the greatest attention in their comparative federalism courses, Canadian faculty responded: the United States, European Union, Belgium, Switzerland, Australia, Spain, and Germany in that order. The few US faculty who reported comparative courses identified Canada as the country receiving the most coverage at both the undergraduate and graduate levels.

All in all, courses in federalism and IGR appear to be much more popular in Canadian political science programs than in US programs. While it may be accurate to conclude that federalism and federalism-related courses can no longer be described as belonging to the "dark continent" of political science teaching in the United States, interest in and commitment to teaching such courses certainly has not reached the level that exists in Canada. Further, American programs pay scant attention to federalism issues from a comparative perspective, whereas comparative federalism is a more common course offering in Canada, although less so than domestic-focused federalism courses.

INSTITUTIONAL FACTORS RELATED TO OFFERING FEDERALISM-RELATED COURSES

We were interested in identifying institutional factors related to the offering of federalism-related courses in both countries. Table 16.3 looks at some features of programs in both Canada and the United States related to the teaching of any federalism course at all, graduate or undergraduate.

Institutional features common to the programs in both Canada and the United States appear to be similarly related to the offering of federalism courses, as revealed in Table 16.3. In both countries, the level of degrees (bachelors, masters, or doctoral) offered by the departments and the universities are related to the likelihood of offering such courses, as is size of university enrolment. Universities and departments offering masters and doctoral degrees are more likely to offer such courses, as are universities having larger enrolments. Interesting to note also is that significantly higher proportions of Canadian universities offer such courses, compared with those in the United States, in every degree and size category examined.

Some regional variation was found in the offering of such courses in the United States. There, departments in the West are much less likely to offer such courses than those elsewhere. Fewer regional differences are evident in the Canadian survey, but some differences were apparent between departments located in Quebec and those in the other provinces. Fewer departments in Quebec reported offering such federalism courses at the undergraduate level than those elsewhere (57 percent

Table 16.3: Proportions Teaching Any Level of Federalism/IGR, Multilevel Government/Governance Courses by Various University Characteristics

Factors	Canada, % (N = 72)	United States, % (N = 393)
Highest level of degree offered by department		
Bachelors	72.7	26.2
Masters	83.3	63.6
Doctoral	100.0	52.6
Degrees offered mainly by university		
Bachelors	80.0	26.3
Bachelors and masters	62.5	48.7
Bachelors, masters, PHD	100.0	54.0
Size of student body		
Under 2,500	75.0	22.6
2,500–5,000	60.0	32.7
5,000–10,000	66.7	41.4
10,000–20,000	100.0	54.0
20,000–30,000	100.0	45.8
30,000 and over	91.7	56.0

Source: US survey conducted in 2013, Canadian survey conducted in 2014.

to 65 percent), but the reverse pertains to graduate courses where 71 percent of departments in Quebec reported offering federalism/IGR courses, compared with 40 percent elsewhere (not reported in Table 16.3). Because of the much smaller number of responses from Canada than the United States, however, caution is urged in interpreting these regional breakdowns.

REASONS FOR NOT OFFERING FEDERALISM-RELATED COURSES

Chairs of departments in both Canada and the United States not offering courses in federalism/IGR or multilevel government/governance were asked why they offer no such courses. Responses are shown in Table 16.4.

Considerable differences in the responses of Canadian and US chairs to the question of why they do not offer federalism-related courses are evident in Table 16.4. The factor cited most often as a reason for not offering such courses by

Table 16.4: Reasons for Not Offering Federalism/IGR, Multilevel Government/Governance Courses

Reasons for not offering federalism/ IGR courses:	Undergraduate American, % (N = 179)	Undergraduate Canadian, % (N = 14)	Graduate American, % (N = 212)	Graduate Canadian, % (N = 22)
Lack of qualified/ interested faculty	40.8	—	31.2	20.0
Other courses more important to students' degree plans	37.4	14.3	23.7	20.0
Low student interest	36.9	7.1	24.7	10.0
Scarce resources	31.8	35.7	14.0	50.0
Issues of federalism covered in other courses	16.2	42.9	4.3	50.0
Declining relevance of federalism	3.4	—	3.2	—
All other reasons	10.6	—	10.7	—

Note: Respondents were permitted to indicate all factors that might apply. Graduate-level responses are shown only for departments offering graduate degrees.
Source: US survey conducted in 2013, Canadian survey conducted in 2014.

chairs of US departments at both the undergraduate and graduate levels is "lack of qualified or interested faculty." Also high on the list of US reasons for not offering such courses are "other courses more important to students' degree plans" and "low student interest." Low student interest and lack of interested faculty were relatively infrequently cited by chairs of Canadian political science departments. There, the most important factor cited was "issues of federalism being adequately covered in other courses." "Scarce resources" was cited as an important factor in not offering such courses by both US and Canadian chairs. Clearly, though, perceived lack of interest by both students and faculty is a much more important factor in not offering such courses in the United States than in Canada.

Table 16.5.1: Course Characteristics

	Undergraduate American, % (N = 60)	Undergraduate Canadian, % (N = 18)	Graduate American, % (N = 35)[a]	Graduate Canadian, % (N = 10)[a]
Department where taught:				
Political science	84.6	94.4	34.3	50.0
Public administration	5.8	—	20.0	30.0
All others	9.6	5.6	45.7	20.0
Course title:				
Federalism or IGR	63.3	65.0	75.0	54.5
Multilevel Governance/ Government	5.4	10.5	6.8	18.2
Other	31.3	24.5	18.2	27.3
Required or elective:				
Required	18.0	27.8	22.8	10.0
Elective	82.0	72.2	77.1	90.0
Course teaching frequency:				
Once a year	41.7	55.6	57.1	60.0
Twice a year	6.3	11.1	11.4	—
Three or more times/year	10.4	—	2.9	—
Not every year	41.7	33.3	28.6	40.0

…continued

Table 16.5.2: Course Characteristics

	Undergraduate American, % (N = 60)	Undergraduate Canadian, % (N = 18)	Graduate American, % (N = 35)[a]	Graduate Canadian, % (N = 10)[a]
Average enrolment:				
5 or less	2.2	—	3.0	10.0
6–10	8.7	—	33.3	50.0
11–15	8.7	11.8	18.2	20.0
16–20	21.7	5.9	33.3	20.0
21–30	32.6	17.6	6.1	—
31–40	6.5	17.6	3.0	
41 and above	19.6	47.1	19.6	
Student interest level:				
Very interested	12.8	39.5	32.3	40.0
Somewhat interested	66.7	56.3	54.8	50.0
Not very interested	20.5	6.3	12.9	10.0
Value to department:				
Very valuable	10.8	43.8	25.0	10.0
Somewhat valuable	73.0	50.0	62.5	60.0
Not very valuable	13.5	6.3	12.5	30.0
Not valuable at all	2.7	—		

[a] Asked only of departments offering graduate degrees.

Source: US survey conducted in 2013; Canadian survey conducted in 2014.

COURSE CHARACTERISTICS, STUDENT INTEREST, AND VALUE TO DEPARTMENT

We asked faculty teaching these courses in both countries about various characteristics of their courses, level of student interest in these courses, and the value they believe their department colleagues consider such courses to be to the curriculum. Results are displayed in Table 16.5.

Table 16.5 reveals a number of similarities, as well as differences, in federalism-related courses as offered in Canada and the United States. In both countries, most of the undergraduate courses are offered in political science departments, but many of the graduate-level courses are offered outside of political science departments. The terms "federalism or intergovernmental relations" are most often used to describe the undergraduate courses in both the United States and Canada, but terms such as "multilevel government or multilevel governance" are often preferred at the graduate level in Canada. Federalism courses are most frequently offered once a year in both countries, although the next most common frequency is "not every year."

Student interest in such courses is reported to be much greater in Canada than in the United States, and especially so at the undergraduate level. Further, Canadian faculty respondents are far more likely than their US counterparts to believe their department colleagues view such courses as "very valuable" at the undergraduate level, but these evaluative relations are somewhat reversed at the graduate level. A considerably higher proportion (30 percent) of Canadian faculty perceive their department colleagues as viewing their graduate-level federalism-related courses as "not very valuable" than do their US counterparts (12.5 percent). All of these results, however, must be tempered by the fact that so few Canadian respondents teach in strictly graduate-level programs.

ONLINE COURSE OFFERINGS

We also asked about the extent to which such courses are offered online, and the impact of online offerings on student interest. Table 16.6 shows results of this question.

A somewhat higher proportion of federalism-related courses appear to be offered online in US programs than in Canadian programs (16.5 percent compared with 12.3 percent). In neither case, however, do most respondents believe such courses have much measurable effect, one way or the other, on student interest in such topics.

Table 16.6: Federalism, IGR, Multilevel Courses Offered Online and Impact of Online Courses

	Any Offered Online, %		Impact of Online Courses, %		
	Yes	No	Increased student interest	Decreased student interest	No effect
United States	16.5	83.5	15.4	15.4	69.2
Canada	12.3	87.7	—	28.6	71.4

Source: US survey conducted in 2013, Canadian survey conducted in 2014.

PREFERRED COURSE TITLES

We asked faculty teaching these courses in both countries to indicate whether they believe the words "multilevel," "collaborative," or "networked" government or governance are preferable terms in the course title to the terms "federalism" or "intergovernmental relations." Roughly a third of faculty from both countries (33 percent from Canada and 30 percent from the United States) indicated the term "multilevel" to be "somewhat" or "much" better than the term "federalism" or "intergovernmental relations." Only about 13 percent of Canadian faculty but 27 percent of US faculty favoured the term "collaborative" or "networked" governance.

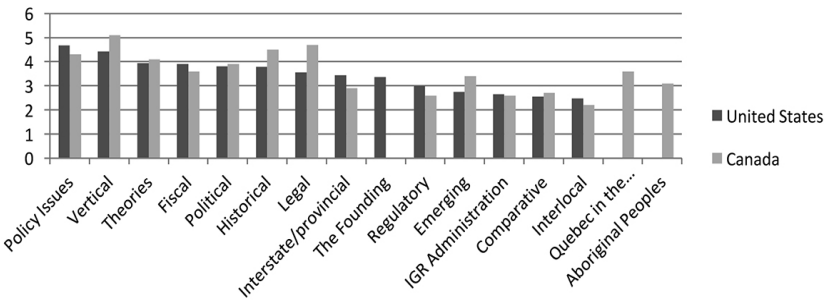
TOPICS AND EXTENT OF COVERAGE

We also wished to identify and compare the topics covered in federalism-related courses and the relative amount of time devoted to each. We are interested in determining whether a core set of federalism-related topics is common to these course offerings in both countries, or whether Canadian and American faculty approach the topic from significantly different perspectives. The topics partly replicate a key part of a survey by Box (1995), who identified core concepts taught in US public administration federalism/IGR courses more than twenty years ago. Box examined forty-two syllabi for graduate, public administration courses on intergovernmental relations or management. He rank-ordered the amount of coverage given to each of the topics listed on the syllabi and uncovered a "set of core concepts," which he labelled "Fiscal, Models, History, Vertical, Policy, Change, Politics, and Legal" (ibid., 28). We seek to determine the extent to which the ranking of topics taught in 1995 is the same as, or different from, those taught today. Figure 16.1 presents the topics covered in both countries, and the amount of time devoted to each, rank ordered from most to least amount of time as reported by US faculty.

A quick glance at Figure 16.1 does reveal a number of similarities in the amount of time devoted to each topic in both countries, but the figure also shows a number of significant differences. (A full description of topics covered is presented in Figure 16.1.) In both countries, proportionally larger amounts of time are devoted to such topics as "policy issues," "vertical federalism," "theories," "fiscal matters," and "political issues." Also, in both countries, proportionally less time is spent on such issues as "IGR administration," "comparative," and "interlocal matters."

On the other hand, faculty in Canada appear to devote considerably more time than their US counterparts to the topics identified as "historical," and "legal," whereas US faculty appear to devote more time to topics identified as "interstate," and "regulatory." The topics unique to the Canadian experience, "Quebec in the federation," and "Aboriginal peoples in the federation," both receive considerable

Figure 16.1: Topics Ranked by Time of Class Coverage



Note: Respondents were asked to estimate the approximate amount of time devoted to each topic during a semester. The scale ranges from 1 to 10, where 0 represents 0 percent, 5 represents about 5 percent, 2 represents about 10 percent, and so forth. Respondents were not required to total their responses to 100 percent. Bar heights represent proportionate amount of class time, ranging from about 15 percent or more at the high end to about 5 percent or less at the low end. The topic category "The Founding" was not asked in the Canadian survey, and the categories "Quebec in the Federation," and Aboriginal Peoples in the Federation" were not asked in the US survey.

Full description of each topic-category as presented to respondents:

Policy issues (policy types and specific policy areas)
Vertical/IGR (relationships between local, state/provincial, and federal, including executive federalism)
Theories (normative/philosophical)
Fiscal (grants, revenue, expenditures, equalization, etc.)
Political issues and actors (interest groups, actors, interactions)
Historical development (change since 1789 [for US], before and after 1867 [for Canada])
Legal/constitutional issues (court cases and laws affecting IGR and state/provincial powers)
Interstate/interprovincial (nationwide and regional cooperation, competition, conflict, uniformity)
The Founding (Framers' philosophy, The Federalist, Anti-Federalists)
Regulatory (pre-emptions, mandates, conditional grants, federal rules)
Emerging (projections of trends, reforms, and developments)
IGR administration/management (collaboration, networking, administration, etc.)
Comparative (cross-national and international comparisons)
Interlocal (inter-local relations, regional cooperation, etc.)
Quebec in the federation (theories, asymmetry, IGR dynamics)
Aboriginal peoples (self-government, representation, treaty federalism, etc.)

attention and time in the Canadian curricula; similarly, the unique US topic, "the Founding," receives considerable attention in the United States.

Based on amount of class coverage time devoted to each topic, then, and with a few important caveats, it seems fair to conclude that a reasonably similar set of "core topics" is common to the teaching of federalism-related courses in both countries, and that in both countries a fairly similar set of topics falls out of the "core." In both countries, faculty report relatively large amounts of class coverage being allocated to such topics as "policy issues," "vertical federalism," "theories," "fiscal," "political," "historical," and "legal." Also in both countries, faculty report relatively less class time committed to such topics as "IGR administration," "comparative," and "interlocal." Even within these broad sets of commonalities, a number of important distinctions exist, and in both countries, topics unique to each receive considerable coverage.

CONCLUSIONS AND DISCUSSION

Our surveys, conducted with political science chairs and faculty in both countries, show significantly larger proportions of departments in Canada offering courses on federalism-related topics at both the undergraduate and graduate levels than is the case in the United States. Also, courses on comparative federalism are more common in Canada, although even in Canada, fewer than half the departments surveyed offer such courses.

At least at the undergraduate level, Canadian faculty reported significantly higher levels of student interest in federalism-related courses, and were far more likely than their US counterparts to believe that such courses are considered to be "very valuable" by their department colleagues. Altogether, then, our survey findings show much more teaching coverage and student and faculty interest in federalism throughout Canada, including in Quebec, than reported by the Canadian studies cited above (McIntosh 1997; Cameron and Krikorian 2002; Privy Council Office 2007; Fafard and Rocher 2009).

For various reasons, courses on federalism-related topics are more popular in Canada and perceived to be more interesting to Canadian students and more valued by department colleagues. Canadian students probably get more exposure to federalism in introductory Canadian politics courses than do American students in comparable courses, where most textbooks devote a chapter to federalism but often with more historical than contemporary coverage of the subject. As such, federalism is more of a path dependent variable for American scholars—namely, one aspect of American governance, especially its history, that is covered in most introductory textbooks but is not of much contemporary relevance to government and politics compared other topics; for Canadian scholars, federalism is more of an independent variable that provides an important explanation of how government

works. Other courses on political parties and public policy in Canada probably also focus more on federalism than in the United States because they must deal with provincial powers and identities that are more salient in Canada than are state powers and identities in the United States. Still, courses on federalism and intergovernmental relations occupy a respectable position in political science curricula in the United States, and available trend data indicate that the popularity of such courses might be growing there. The embrace of states' rights and "progressive federalism" by contemporary liberals (e.g., Abramsky 2017) in the face of recent Republican presidential administrations, and now especially Donald Trump, could increase academic attention to federalism.

Our data cannot tell us why the teaching of federalism appears to be more common and more valued in Canada than in the United States. Perhaps the country difference reflects both a decline of interest in federalism in the United States and a persistence of interest in federalism in Canada. In the United States, no presidential candidate since 1980 has made federalism a campaign issue or proposed another New Federalism. Although the Harper government took a more hands-off approach to federalism, mainly in social policy, it provoked conflicts with provinces over Senate reform, securities regulation, infrastructure spending, and other matters.

The term "federalism" seems to be more common in Canadian political discourse than in American discourse. Canada has experienced several constitutional crises over the past sixty years, and some of Canada's most important policy issues, such as healthcare, environmental protection, and fiscal equalization, are based on negotiated intergovernmental agreements. Negotiations of many issues by first ministers and other ministers through intergovernmental meetings in Canada under most prime ministers except Harper probably draw more public attention to federalism compared to annual meetings between the National Governors Association and the US president and gubernatorial lobbying in Washington, DC, which attract almost no media or public attention. There is little genuine negotiation between federal and state officials in the American federal system; instead, state officials are consigned to lobbying.

We noted also at the outset the many important structural, fiscal, and administrative differences existing between the Canadian and American models of federalism. Perhaps the asymmetrical and comparatively decentralized features of Canadian federalism contribute to course and teaching distinctions. Topics of federalism might be more relevant and interesting in Canada due to the presence of its French-speaking national minority and all of the political, governmental, and cultural issues attendant to Quebec's position and aspirations in the federation as well as the potential that federalism holds for self-governance by other minority nations and some regions in the West and the Atlantic. Federalism, moreover, remains more contested in Canada than in the United States. For many French Canadians, the federation is a compact between two or three distinct nations. For many non-French Canadians, federalism suggests a strong central government having superiority over the provinces or, alternately, a confederal arrangement

involving provincial superiority over the national government. In addition, a vision of dualistic coordinate federalism seems common in Quebec compared to a more cooperative federal vision elsewhere.

The very survival of Canada depends on federalism in a way that is no longer true in the United States. Perhaps the teaching of federalism-related issues in the United States has yet to fully emerge from the "dark continent" of political science teaching and from the lingering association held by some with negative and racist aspects of the term "states' rights," a term frequently linked with federalism in the United States. Provincial autonomy in Canada is not associated with the kinds of reactionary policies, such as racial segregation, associated with states' rights in the United States. Furthermore, Canadians are attached to their provinces more strongly than are Americans to their states.

So, to answer the question posed by the title of this essay, the teaching of federalism is "alive" in both Canada and the United States. Although it probably is fair also to conclude that federalism teaching is doing "well" in both countries, it appears to be significantly more appreciated and valued in Canada. Surveys seem to indicate that the offering, and the interest in offering, federalism and federalism-related courses at both the graduate and undergraduate levels in the United States are sizable, but it remains to be seen whether the level of such course offerings will reach the level present in Canada.

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