



New Tools for New Times

**A Sourcebook for the Financing,
Funding and Delivery of Urban Infrastructure**

Casey Vander Ploeg
Senior Policy Analyst

September 2006

EMBARGOED until Wednesday September 27, 2006 at 7 am MST



Western Cities Project



The livability and economic prowess of our large cities is of fundamental importance to western Canada's quality of life and long-term prosperity. The fate of our large cities is a key determinant of the future of our democracy, economy, and way of life. Understanding the constellation of issues that must be addressed for our cities to reach their potential and compete with the great cities of the world is the goal of the Canada West Foundation's **Western Cities Project**. The project has been providing decision-makers and the public with timely and accessible information about urban issues and putting forward practical recommendations for addressing urban public policy challenges since 2000. With the generous support of the Cities of Calgary, Edmonton, Regina, Saskatoon, Vancouver, and Winnipeg, we have embarked on a new phase of the project that runs until the end of 2008. This new phase will include groundbreaking work on street level social problems, innovative options for funding urban infrastructure, the economies of western Canada's big cities, public transit, the connections between inner city areas and suburban areas, and the intergovernmental relationships that cut across these and other issues.

For more information about the **Western Cities Project**, please contact Canada West Foundation Director of Research Robert Roach (roach@cwf.ca).

This report was prepared by Canada West Foundation Senior Policy Analyst Casey Vander Ploeg with assistance from Canada West Foundation Policy Analyst Kari Roberts. This report is part of the Canada West Foundation's **Western Cities Project**. This specific study has been made possible in part through a financial contribution from **Infrastructure Canada**. The opinions expressed in this document are those of the author and are not necessarily those of Infrastructure Canada, or the Canada West Foundation's Board of Directors, its advisors, or its funders. Permission to use or reproduce this report is granted for personal or classroom use without fee and without formal request provided that it is properly cited. Copies may not be made or distributed for profit or commercial advantage. Copies are available for download at no charge from the Canada West Foundation website: www.cwf.ca. The author expresses his sincere thanks to Robert Roach and Loleen Berdahl for their contributions to this document.

Contents

2	.....	Executive Summary
4	.....	Part I
4	.....	Introduction
5	.....	Infrastructure Finance Tools
14	.....	Matching Tools to Infrastructure
24	.....	Winning Conditions
28	.....	Current State of Innovation in Canada's Large Cities
34	.....	Innovative Urban Infrastructure Finance and Federal and Provincial Governments
35	.....	Conclusion
37	.....	Part II
37	.....	Finance Tools
37	.....	Pay-As-You-Go
53	.....	Borrowing
72	.....	Funding Tools
72	.....	Taxation
113	.....	User Fees
137	.....	Delivery Tools
137	.....	Public
142	.....	Private
148	.....	Public-Private Partnerships
161	.....	Other Innovations
162	.....	Bibliography

Executive Summary

Background

The infrastructure needs of Canada's cities—both for new construction and the rehabilitation of existing infrastructure—are significant and growing. The current methods of financing, funding, delivering and maintaining urban infrastructure are insufficient and inadequate, as is evidenced by Canada's mounting urban infrastructure debt. For this reason, municipal, provincial and federal governments together must begin using innovative tools that can provide expanded financial resources to increase the supply of infrastructure and leverage other policy objectives such as keeping demand for infrastructure in check.

New Tools for New Times is a one stop shop for information on both traditional and innovative infrastructure financing, funding and delivery tools. The report also assesses the applicability of the tools to various types of urban infrastructure and the role of governments in advancing their use in Canada.

Innovative Infrastructure Finance

Canadians tend to assume that options for infrastructure finance are limited to the status quo. It is true that the methods of infrastructure finance cannot be expanded. The triple-two rule asserts that there are only two ways to finance, two ways to fund, and two ways to deliver infrastructure. In terms of financing, governments can either borrow or use pay-as-you-go. In terms of funding, governments can either use taxation or user pay. In terms of delivery, infrastructure can be provided publicly through government or through non-governmental actors such as the private or nonprofit sector. However, while the basic methods are limited, the range of tools available to implement them is broad. It is with respect to these tools that Canadians have the opportunity to innovate.

There are three types of innovation. First, governments can employ traditional tools, but simply use them differently (e.g., earmarking property taxes for capital purposes). Second, governments can employ new tools (e.g., tax-exempt bonds). Third, familiar methods can be applied to infrastructure systems to which they have not generally been applied in the past. This third option is the heart of innovative infrastructure finance. Roadways, for example, have traditionally been financed on a pay-as-you-go basis, funded through taxation, and delivered publicly. But a new road could also be debt-financed, funded with user fees (tolls), and privately delivered.

Innovative infrastructure finance tools are designed to increase the amount of fiscal space within government budgets by increasing the amount of financial resources available for infrastructure, improving cash flows, and enhancing accountability and transparency. Innovative infrastructure finance is also designed to lever other policy objectives such as checking excessive demand for infrastructure and placing it on a more sustainable foundation by allowing for adequate financing and funding over the long-term and better management of capital assets across their whole life cycle.

A survey conducted by Canada West Foundation found pockets of innovation in Canada's largest cities, but little to no wholesale uptake. The reasons for this are many, including a lack of awareness about innovative approaches and the restrictive policy environment in which cities operate.

Winning Conditions

For innovation to flourish in Canada, a number of core winning conditions are necessary (the winning conditions needed for the uptake of specific tools are outlined in Part II of the report).

Canada's municipalities exist within a highly regulated framework that precludes the use of many innovative tools. As such, changing the legislative environment and unleashing cities is a prerequisite to innovation. Across the globe, the uptake of innovative infrastructure finance started at the local level, but was only made possible when a change in thinking also occurred at higher levels of government.

There must be at least some sense of crisis surrounding the infrastructure issue within the broader political and economic environment. Wholesale changes in how infrastructure is financed, funded and delivered will only be considered by governments and accepted by the public at large when there is a sense of urgency attached to the matter, and a realization that the situation will worsen considerably without immediate action.

A consensus must emerge that the current approaches are simply inadequate to the task. This consensus must go beyond a recognition that traditional approaches fail to provide sufficient revenue. The consensus must also recognize that traditional approaches have fuelled

unnecessarily high demand for infrastructure. Innovative infrastructure finance is not just about ensuring sufficient revenue to increase the supply of infrastructure—it is also about keeping the demand for infrastructure in check

Governments must resist the temptation to pick only one or two of the tools that they like best. If innovative infrastructure finance is to be successful, governments must carefully assess their infrastructure needs, scan the list of available tools, and then put into play those tools that offer the best solutions for financing, funding and delivery.

Finally, innovative infrastructure finance is heavily dependent on governments and citizens coming to grips with a fundamental question behind infrastructure: what is the primary objective of providing infrastructure? Is the primary goal to redistribute income and ensure universal access at all costs? Or, is the main objective to provide the right amount of infrastructure at the right cost for those who use it, and to do so through the most effective and efficient means possible? If the answer to the question leans heavily toward the first option, then innovative infrastructure finance will have a hard time taking root. When a consensus emerges that there are better and more effective ways to redistribute income, the focus can shift toward more effective and economically efficient infrastructure provision. This is the fertile field in which innovation can germinate and flower.

Promising Tools

While there are many viable options for innovative infrastructure finance, a number are particularly promising in the Canadian context.

Finance includes borrowing and pay-as-you-go. The most promising borrowing innovations include putting into play the principles of smart debt, creating new federal and provincial credit enhancements, and establishing either a national infrastructure bank or a series of provincial ones. The most promising innovative pay-as-you-go tools are the earmarking of current and future property tax revenues for general capital purposes and exploring the full range of rapidly expanding leasing options.

Funding includes taxation and user pay. The most promising taxation innovations include committed, specified long-term federal and provincial grants (municipalities should be allowed to use a portion of these grants to cover the interest on debt used to finance infrastructure); specialized federal and provincial grants

that are contingent upon the use of innovative tools (e.g., PPP structures and road tolling); enabling municipalities to employ user pay taxation (e.g., local option fuel taxes, local vehicle sales taxes, parking taxes, car rental taxes, and vehicle ownership or registration taxes; and providing municipalities access (be it through provincial-municipal tax sharing or other means) to taxes that keep pace with population and economic growth, such as income and general retail sales taxes.

The most promising user pay funding innovations involve converting infrastructure and municipal services currently dependent on the tax base to a system of user pay. For infrastructure that is already funded with user fees, the emphasis should be on innovations that promote proper pricing, including full cost recovery of operations, capital, and future capital needs.

Delivery includes public and private/nonprofit delivery. The most promising delivery innovation would be for municipalities to consider moving away from the traditional government department system and take advantage of the many benefits that accrue from creating new utilities and corporatizing existing utilities. Governments in Canada must move beyond a simple hit-and-miss approach to PPPs and begin building a larger and more robust programmatic commitment. As a first step, municipalities should explore the various PPP arrangements for operations and services, including alternative service delivery, operations and maintenance contracts, and managed competition.

Conclusion

The need for new policy tools and approaches to financing, funding and delivering urban infrastructure is increasingly evident. Canada has not been completely idle in terms of innovation, but efforts to date are insufficient to meet the challenge ahead.

If a huge infrastructure funding gap is the bad news, then the good news is the sheer number of the policy choices open to meet that gap head on. Canada's choices are not limited to hiking property taxes, slashing programs, and holding back on capital investment. There is a wide range of policy alternatives that point in other directions. What is needed is a concerted effort by all three orders of government to show leadership and a degree of boldness in pursuing new alternatives. Municipalities cannot—and should not—be burdened with the urban infrastructure debt alone; provincial and federal governments must also take responsibility and begin establishing a set of incentives to encourage creativity.

PART I

1. Introduction

Growing concerns about Canada's urban infrastructure debt have raised interest in innovative options for financing current and future infrastructure projects. In 2005, the Research and Analysis Division of Infrastructure Canada commissioned the Canada West Foundation to conduct a study of innovative approaches to the financing, funding and delivery of urban infrastructure. The result is *New Tools for New Times: A Sourcebook for the Financing, Funding and Delivery of Urban Infrastructure*. The report answers five questions:

1. What infrastructure finance tools are available, and which of these can be considered innovative?
2. What factors must be considered in matching finance tools with infrastructure projects?
3. What are the winning conditions for the use of infrastructure finance tools?
4. Which infrastructure finance tools are currently in use in Canada's large cities?
5. What are the implications of innovative infrastructure finance for governments?

This report builds on two previous Canada West Foundation research studies. In 2003, the Canada West Foundation released *A Capital Question: Infrastructure in Western Canada's Big Six*. This in-depth analysis of the infrastructure needs of western Canada's six big cities (Vancouver, Calgary, Edmonton, Regina, Saskatoon, and Winnipeg) reinforces the fact that urban infrastructure has become a serious issue. For example, in the 2003 fiscal year alone, the six big western Canadian cities reported a combined critical infrastructure investment shortfall of \$564 million (Vander Ploeg 2003).

In 2004, the Canada West Foundation released *No Time To Be Timid: Addressing Infrastructure Deficits in the Western Big Six*. This study concludes that the traditional municipal capital financing, funding and delivery tools, as currently employed by Canadian cities, are not able to fully address their infrastructure needs. Canadian cities must innovate and embrace new approaches.

Two methods were used to prepare *New Tools for New Times*: 1) an exhaustive review of Canadian and international academic papers, government studies, conference presentations, media stories, and websites was conducted; and 2) an electronic survey was sent to the core cities in each of Canada's 27 Census Metropolitan Areas. The survey was used to assess awareness of innovative infrastructure financing, funding and delivery tools and the extent to which they have been used in Canada's large urban centres.

Readers should note that this study is not designed to systematically rank infrastructure financing, funding and delivery tools based on performance criteria. (See Gunaydin, London, Saltzman, Skinner 2003, and Infrastructure Canada 2004 for this type of analysis.) Instead, this study examines the advantages and disadvantages of a wide range of tools, their applicability to various types of infrastructure, and the winning conditions that facilitate their use.

While this study is primarily concerned with financial mechanisms, the discussion cannot be entirely divorced from a wider range of non-financial tools. For example, improved infrastructure demand management strategies may reduce the need for new infrastructure and, in turn, the need for new financing and funding.

The report's analysis and findings relate to the situation found in large urban centres. The degree to which they apply to smaller centres is beyond the scope of this study.

The report is divided into two parts. **Part I** presents an overview of the innovative urban infrastructure financing, funding and delivery tools that form the toolkit from which Canadian decision-makers can draw, and the winning conditions that facilitate the use of these tools. Part I also includes a summary of the main tools currently in use in Canada's large cities and a discussion of the implications of an expanded toolkit for Canadian governments.

Part II presents a detailed taxonomy of the urban infrastructure financing, funding and delivery tools identified in Part I.

2. Infrastructure Finance Tools

It is critically important to understand that there are only two basic methods of *financing* infrastructure, two basic methods of *funding* that financing, and two basic methods of *delivering* infrastructure. This triple-two rule is a useful frame for any discussion of innovative infrastructure finance.

Financing infrastructure. The financing of infrastructure refers to how the up-front capital for constructing a new asset, or renewing, rehabilitating or reconstructing an existing asset, is secured. There are only two methods available: 1) an asset can be financed by borrowing, or 2) on a pay-as-you-go basis where the government covers the up-front costs through current revenues or savings. Up-front capital for financing can also be provided through some combination of borrowing and pay-as-you-go, but this simply blends the two basic methods.

Funding infrastructure. The funding of infrastructure is a separate matter from the financing of infrastructure. The funding of infrastructure refers to how the up-front capital costs are repaid or recovered. Again, there are only two methods available: 1) general tax revenue is used to fund the debt and taxpayers pay for the infrastructure whether they use it or not; or 2) governments impose user fees on the infrastructure and use the revenue to repay debt or to recover up-front capital costs. Funding can be provided through a combination of the two options, but taxes and user fees remain the only two basic methods.

Delivering infrastructure. As with financing and funding, there are only two methods for delivering infrastructure: 1) the public sector can do it (the traditional approach currently used for most urban infrastructure); or 2) the private sector can do it. When the two sectors jointly deliver an infrastructure asset, it is called a public-private partnership.

Some argue that there is an emerging third option where the nonprofit sector is used as the delivery mechanism. Removing the profit motive from the equation may be more palatable in some situations (e.g., if there is stiff opposition to private delivery) and nonprofit organizations possess a number of characteristics that may give them an edge over the private sector and government (see McFarlane and Roach 1999).

On the other hand, it is often the efficiencies associated with the profit motive that make the case for a switch from public to private delivery. As with the application of all forms of infrastructure finance, the specific circumstances and goals of the infrastructure project in question must be identified and carefully considered before making a decision about which specific approach to take. Whether an infrastructure asset is provided privately or through the nonprofit sector, the main point is that both approaches are quite distinct from public delivery.

While there are a limited number of *methods*, there are a multitude of *tools* that can be used within each particular method. For example, taxation tools employed by cities around the globe range from general property taxes to sales taxes.

Figure 1 presents a taxonomy of the many tools that can be employed and categorizes them as either traditional or innovative (see Part II of this report for more detail).

Innovative Infrastructure Finance

While the concept of innovative infrastructure finance has become popular in the infrastructure policy community, attempts at a formal definition are rare and inadequate. The meaning is often presupposed, but this is far from the case.

In this report, the definition developed by the US Federal Highway Administration is used:

Innovative infrastructure finance is a broadly defined term that includes a number of tools that supplement traditional sources and methods of financing to overcome cash flow shortages and attract new sources of capital (Federal Highway Administration 2004).

When discussing innovation, it is important to remember that it is a relative concept. For example, a tool that is foreign to Canada may be standard practice in other jurisdictions. What is innovative in Canada may not be all that innovative somewhere else. Also, yesterday's innovation quickly becomes today's routine practice. For example, it used to be very difficult to secure financing to construct a limited access toll road using future toll revenues as collateral because they were not considered reliable. Today, future toll

FIGURE 1: Taxonomy of Urban Infrastructure Finance, Funding and Delivery

1. FINANCE TOOLS	Innovative Borrowing Tools (Continued)
<p>1.1. Pay-As-You-Go</p> <p>1.1.1. Traditional Pay-As-You-Go</p> <ul style="list-style-type: none"> a. Transfers to Capital From Current Revenue <ul style="list-style-type: none"> • Current General Property Tax Revenue • Current Selective Sales Tax Revenue • Current Operating User Fee Revenue • Current Miscellaneous General Purpose Revenue • Operating Budget Surplus of the Prior Year b. Local Improvement Levies and Special Assessments c. Intergovernmental Grants and Contributions d. Intergovernmental Tax Revenue Sharing e. Reserves and Reserve Funds f. Operating and Capital Leases <p>1.1.2. Innovative Pay-As-You-Go</p> <ul style="list-style-type: none"> a. Earmarking Current General Property Tax Revenue <ul style="list-style-type: none"> • Earmark Current Property Taxes for General Capital • Earmark Future Revenue Growth for General Capital b. Increase Tax Rates for Current Basket of Tax Sources <ul style="list-style-type: none"> • Earmarking • Voter-Approval Process • Sunset Tax Increases • Cap Tax Rate c. Lower/Eliminate Education Portion of Property Tax d. Policy to Address Revenue Inelasticity e. Create Strategic Reserves and Reserve Funds f. Lease-Purchase-Financing <ul style="list-style-type: none"> • Tax-Exempt-Lease-Purchase-Financing • Guaranteed Savings Leases • Master Leases g. Leaseback Arrangements <ul style="list-style-type: none"> • Purchase-Lease-Leaseback • Purchase-Sale-Leaseback-Re-Purchase • Cross-Border Tax Leasing and Leaseback <p>1.2. Borrowing</p> <p>1.2.1. Traditional Borrowing</p> <p>Short-Term Financing</p> <ul style="list-style-type: none"> a. Bank Financing (Short-Term, Bridge Financing) b. Negotiated Borrowing (Partner with Private Parties) <p>Long-Term Financing</p> <ul style="list-style-type: none"> c. Regular Amortized Debenture Bond d. Pooled Debentures e. Borrowing Against Reserves f. Local Improvement or Special Assessment Debentures <p>1.2.2. Innovative Borrowing</p> <p>a. Short-Term Financing</p> <ul style="list-style-type: none"> • Tax Anticipation Notes (TANs) • Revenue Anticipation Notes (RANs) • Bond Anticipation Notes (BANs) • Grant Anticipation Notes (GANs) • Capital Outlay Anticipation Notes (CONs) 	<ul style="list-style-type: none"> b. Smart Debt <ul style="list-style-type: none"> • Project Selection • Optimal Debt Levels • Amortization • Debt Structure (Regular, Retractable, Bullet) • Repayment Policies c. Senior Government Credit Enhancements <ul style="list-style-type: none"> • Lines of Credit • Interest Rate Subsidies • Subsidies for Bond Issuance and Insurance • Loan Guarantees • Subordinate vs. Senior Debt Positions • Direct Loans d. Municipal Community Bonds e. Municipal Tax-Exempt Bonds (TEBs) <ul style="list-style-type: none"> • General Obligation or GO Bonds (Recourse Bonds) • Revenue Bonds (Non-Recourse and Limited Recourse) <small>(Both types of TEBs come in many forms such as Zero-Coupon Bonds, Lease-Purchase Bonds, Lease-Payback Bonds, Public-Lease-Revenue Bonds, Leaseback Financing Bonds, Certificates of Participation (COPs), Private Activity Bonds, TIF Bonds, Redevelopment Financing Bonds, Interest-Free Bonds, Real Return Bonds, and "Mello-Roos" Bonds.)</small> f. Bond Banks g. Revolving Loan Funds h. Infrastructure Banks i. Private and Public Pension Plan Capital j. Asset-Backed Borrowing <p>2. FUNDING TOOLS</p> <p>2.1. Taxation</p> <p>2.1.1. Traditional Taxation</p> <ul style="list-style-type: none"> a. Property Tax Revenue <ul style="list-style-type: none"> • General Residential, Commercial, Industrial Property Tax • Special or Supplemental Business Property Taxes • Other Property-Based Tax Levies b. Local Improvement Levies or Special Assessments c. Selective Sales Tax Revenue <ul style="list-style-type: none"> • Utility Franchise, Revenue-in-Lieu, or Sales Taxes • Local Entertainment or Amusement Taxes d. Intergovernmental Tax Revenue Sharing <ul style="list-style-type: none"> • Federal Fuel Tax • Provincial Fuel Tax • Provincial Traffic Tickets and Fine Revenues e. Intergovernmental Transfers <ul style="list-style-type: none"> • Federal Conditional Capital Grants • Federal Unconditional Capital Grants • Federal Revenue-in-Lieu of Tax • Provincial Conditional Capital Grants • Provincial Unconditional Capital Grants • Provincial Revenue-in-Lieu of Tax • Intermunicipal Grants and Contributions f. Other General Purpose Revenue <ul style="list-style-type: none"> • Interest Income on Financial Investments • Net Earnings of Municipal Corporations • Municipal Fines, Forfeits, Tax Penalties, and Other

A detailed version of this taxonomy can be found in Part II of this report.

2.1.2. Innovative Taxation

- a. Tax Incremental Financing (TIF)
- b. Implement New Taxes
 - Ensure Revenue Neutrality
 - Focus on User Taxes or Benefit Taxes
 - Use Percentage-Based Tax Rates
 - Voter-Approved Taxes
 - Capping of the Tax Rate
 - Earmark for Capital, Specific Purpose, or Projects
 - Employ Sunset Clauses
- Property Taxes
 - Special Capital Levy on the General Property Tax
 - Differential Property Taxation
 - Property Tax on Personal Property
 - Land Value Capture or Land Value Uplift Taxes
 - Site Value Taxation
- Other Real Estate Based Taxes
 - Real Estate Transfer Tax (RETT)
 - Development Tax
 - Blight Taxes
 - Parcel Taxation
- General Retail Sales Taxes
 - Local Option Sales Taxes (LOST)
 - Special Local Option Sales Taxes (SPLOST)
 - Municipal Option Sales Taxes (MOST)
- Selective Sales and Excise Taxes
 - Lodging and Accommodations Tax
 - Restaurant Tax
 - Alcoholic Beverages (Bar or Pub Tax)
 - Alcoholic Beverages (Off-Sales)
 - Gambling Tax
- Vehicle-Specific Sales and Excise Taxes
 - Local Option Fuel Tax (LOFT)
 - Local Vehicle Sales Tax
 - Local Car Rental Tax
 - Local Parking Tax
 - Local Vehicle Ownership or Registration Tax
- Income Taxes
 - Personal Income Tax
 - Corporate Income Tax
- Business Taxes
 - Gross Receipts Tax
 - Payroll Tax
 - Employee Tax
 - Business Occupation Tax
- Other Taxes
 - Head Tax or Poll Tax
 - Miscellaneous Taxes
- c. Expanded Tax Revenue Sharing as “Second Best” Alternative
 - Income Taxes
 - General Retail Sales Tax

Innovative Taxation Tools (Continued)

- d. Modified Conditions for Federal and Provincial Capital Grants
 - Borrowing and Grants
 - Garvee Grants
 - Federal Revenue Anticipation Notes (FRANs)
 - Conversion of Advance Construction
 - Modified Cost-Sharing Arrangements
 - Flexible Matching
 - Tapered Matching
 - Specialized Grant Funding Requiring Innovation
 - Grants for Marginally Marketable Projects
 - Grants for PPP Projects
 - Grants for Pricing Initiatives
 - Grants for Road Tolling Initiatives

2.2. User Fees

2.2.1. Traditional User Fees

- a. Trading Fees or Fee for Service
 - Partial Cost Recovery
 - Average Cost Pricing
 - Inappropriate Rate Structures
 - Flat or Fixed Rate
 - Constant Unit Rate
 - Two-Part Tariffs
 - Variable Rates
- b. Development Cost Charges (DCCs)
 - Uniform DCC Fees
 - Negotiated DCC Fees
 - On-Site DCC Fees

2.2.2. Innovative User Fees

- a. Proper Pricing
 - Full Cost Recovery
 - Marginal Cost Pricing
 - Variable Unit Rates
 - Multi-Part Tariffs
 - Peak Period Pricing
 - Differential User Fees
- b. Developer Cost Charges (DCCs)
 - Variable
 - Expanded On-Site
 - Expanded Off-Site
 - Linkage
 - Density Bonusing
 - Maintenance and Replacement
 - Front-Ended
 - Scheduled

Innovative User Fee Tools (Continued)

- c. Converting Current Tax Supported Infrastructure to User Pay
 - Water Treatment and Distribution
 - Wastewater Collection and Treatment
 - Storm Water Drainage
 - Solid Waste Collection and Recycling
 - Roadways, Tunnels, Bridges
 - Direct Tolling (Real Tolls)
 - Variable Tolling (Value Pricing or Peak Period Tolls)
 - Indirect Tolling (Shadow Tolls)
 - Partial Tolling
 - Cordon Tolling (Congestion Tolls)
 - Vehicle-Miles-Travelled Fees (VMT Fees)

3. DELIVERY TOOLS**3.1. Public****3.1.1. Traditional Public**

- a. Government Departments
- b. Decentralized Agencies
- c. Taxation and User Fee Funding
- d. Publicly Owned Infrastructure and Capital Equipment
- e. Public Employees
- f. Limited Private Participation
 - Private Design (D)
 - Private Bid Build (BB)
 - Private Investment Capital

3.1.2. Innovative Public

- a. Creation of New Municipal Utilities
- b. Corporatization and Public Interest Companies (PICs)
- c. Special District Financing

3.2. Private**3.2.1. Traditional Private**

- a. Private Investor-Owned Companies
- b. Design-Finance-Build-Own-Operate (DFBOO)
- c. User Fee Funding
- d. Private Investment Capital
- e. Private Employees
- f. Significant Public Participation
 - Government Regulation
 - Government Facilitation
 - Tax Subsidies

3.2.2. Innovative Private

- a. Privatization or Full Divestiture
- b. Sale-Leaseback Arrangements

3.3. Public-Private Partnerships (PPP)

- a. PPPs for Operations and Service Delivery
 - Service Contracts (Inputs)
 - Alternative Service Delivery (Outputs)
 - Operations and Maintenance (O&M) Contracts
 - Managed Competition
- b. Familiar PPP Configurations for Existing Infrastructure and Municipal Services
- c. Familiar PPP Configurations for New Infrastructure and Municipal Services

4. OTHER INNOVATIONS

- a. Strategic Capital Asset Management
 - What do we own?
 - What would it cost to rebuild?
 - At what stage in the life-cycle are the assets?
 - Maintenance, rehabilitation or replacement?
 - When do we need to spend?
 - How much do we need to spend?
- b. Maximize Existing Capacities
 - Multi-use facilities
 - Regional infrastructure provision
 - Blended financing
 - Joint public-public development
- c. Demand Management Strategies
- d. Reform of Standards
- e. Accrual Accounting
- f. Activity-Based Accounting
- g. Donations and Sponsorships
- h. Community and Neighbourhood “Self-Help” Programs
- i. Pooled Purchasing and Resource Sharing
- j. Small Scale Private Infrastructure

revenues are being accepted as sufficient security to bankroll billions of dollars in road construction around the world. In short, innovative infrastructure finance is relative with respect to geography and time (Cohen 2002). With that said, there are three types of innovation, broadly speaking.

Same tool, but used differently. Innovation occurs when an existing tool is used in a different way. For example, cities in Canada often use property taxation as a means to service the debt incurred to finance a public capital asset. An innovative variation of this would be to earmark a portion of the general property tax rate to pay for the debt servicing of a major infrastructure project. Earmarking allows taxpayers to better see their tax dollars at work, making it politically easier to raise tax revenues for specific projects.

Employing entirely new tools. A second type of innovation occurs when governments use a new tool (i.e., one that has not generally been employed before). For example, Canadian municipalities borrow to cover the up-front capital costs of building infrastructure. There is nothing new about debt-financed municipal capital assets in Canada. However, this borrowing is typically accomplished by a single tool—the issuing of debentures. But this is not the only tool that can be used to borrow. In the US, municipalities borrow using tax-exempt bonds (TEBs). TEBs act like debentures, but the interest proceeds accruing to the bondholder are exempt from federal and state income tax. When the Ontario Municipal Economic Infrastructure Financing Authority issued its first batch of opportunity bonds in 2003, it constituted innovation in the Canadian context because it had not been tried in Canada (Burlington 2004).

Employing familiar methods for financing, funding and delivery, but applying them to different types of infrastructure. A particularly robust form of innovation occurs when one of the two basic financing methods, one of the two basic funding methods, or one of the two basic delivery methods is applied to an infrastructure asset to which it has generally not been applied to in the past. In many ways, this is the heart of innovative infrastructure finance.

For example, public-private partnerships are innovative because the private sector is participating in the construction and operation of a public infrastructure asset that has traditionally been the domain of the public sector. Consider

large urban expressways: this type of infrastructure is typically financed through a combination of borrowing and pay-as-you go. The funding is generally raised through taxation, and the public sector is the provider. However, across Europe, Southeast Asia, and the US, governments have formed public-private partnerships to build these assets. The private partner is invited to design and construct the asset and to take responsibility for borrowing the money to build it. The private sector is then granted a concession to operate the infrastructure for a set period of time. During the concession period, the private partner collects tolls to service the debt. After the debt is repaid, the asset reverts back to public control. What used to be financed through debt and pay-as-you-go, funded by taxation and delivered publicly, is now completely debt-financed, funded by user fees, and delivered by the private sector (with public oversight). Such approaches arguably constitute the most radical innovation.

The Need for Innovative Finance

It is important to understand why innovative infrastructure finance it is necessary in Canada. The case for employing innovation rests upon two arguments: 1) current approaches are insufficient to secure the huge amount of capital required to meet the demand for urban infrastructure; and 2) long-term solutions must address the drivers that help create the problems in the first place.

The shortfall in funding for necessary investments in infrastructure, including the rehabilitation and replacement of existing infrastructure and the construction of new infrastructure, has been coined the infrastructure debt. (Annual shortfalls in funding are typically called the infrastructure deficit.) The municipal infrastructure debt in Canada was estimated in 2002 to be \$57 billion. In the absence of any remedial action, this amount could grow to \$110 billion within the next 25 years (Mirza 2003).

When considering the infrastructure owned and maintained by all three orders of government in Canada, the current infrastructure debt stands at some \$125 to \$130 billion. If action is not taken, some analysts contend that the backlog could grow to \$200-\$400 billion by 2020 (Comeau 2001; Mirza 2003). In 2003 alone, the six big cities in western Canada postponed over half a billion dollars in necessary infrastructure expenditures due to a shortage of funding.

Innovation and Tax Supported Infrastructure

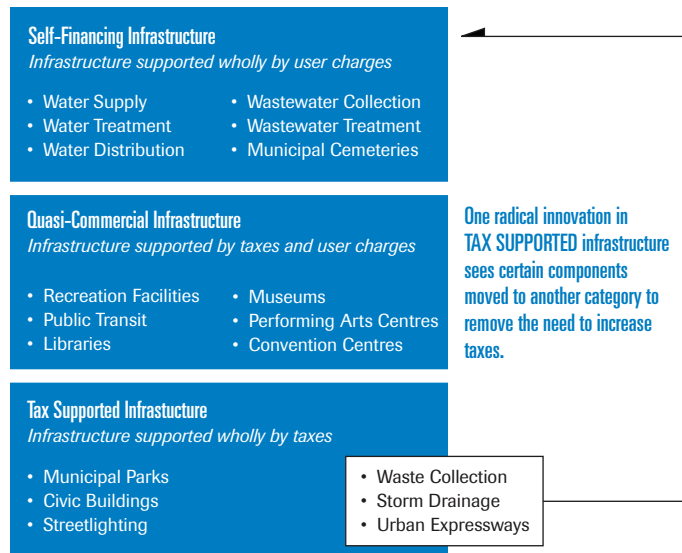
There are three types of urban infrastructure:

1) *Tax supported* infrastructure is entirely supported by general property taxation such as open access parks and urban road networks that are not priced to individual users, but supported wholly by taxation.

2) *Self-financing* infrastructure is commercial, marketable, or enterprise infrastructure. This type of infrastructure is provided on a user-pay basis. The fees generated by the infrastructure are sufficient to cover the up-front capital costs of construction and funding the ongoing operation, maintenance, and eventual renewal, rehabilitation and replacement of the asset. In many Canadian cities, water supply, treatment, and distribution, as well as wastewater collection and treatment, are provided using a commercialized user pay system.

3) *Quasi-commercial or blended infrastructure* combines the tax supported and self-financing approaches, using both taxation and user pay as a source of funding. User fees are charged to individuals in an attempt to recover a portion of the capital, maintenance, and operational costs of the asset, but the amounts charged are insufficient to cover all of the costs of the infrastructure or its ongoing operation. Thus, a tax subsidy is provided. Typical examples include public transit, recreation facilities, museums, and art galleries.

FIGURE 2: Innovative Finance and Urban Public Infrastructure Categories



Source: Adapted from the US Federal Highway Administration *Innovative Finance Primer*.

Many of the innovations in infrastructure finance, funding, and delivery are those which specifically and intentionally target tax supported urban infrastructure as opposed to blended or self-financing infrastructure. Innovation does not entirely ignore infrastructure that is funded by user pay systems, but this category of infrastructure asset takes a back seat when it comes to innovative infrastructure finance.

Indeed, the most innovative options are those designed to intentionally push tax supported infrastructure into the blended or self-financing categories. The aim is to convert tax supported infrastructure into a user pay model (see Figure 2). This avoids the thorny decision of whether to increase property taxes or issue debt to meet infrastructure funding shortfalls.

Classic examples of this type of innovation include the revival of roads, bridges, and tunnels funded by tolls as opposed to general taxation. Other examples include the efforts of some cities to convert their solid waste collection services and storm drainage infrastructure to user pay systems by creating new self-financing municipal utilities. In Ontario, for example, cities are beginning to experiment with funding the capital and operational costs of their waste management collection system through a user pay system as opposed to taxation. The City of Edmonton was one of the first cities in Canada to move its storm drainage services into a new municipal utility and Regina recently created a new solid waste collection utility.

The size of the infrastructure debt supports the need to consider new alternatives, particularly given the narrow range and limited revenue-generating capacity of current municipal government tax tools. Attempting to close the infrastructure funding gap with traditional sources such as the general property tax is unrealistic and unsustainable. In 2003, for example, the City of Edmonton projected a \$3.2 billion infrastructure funding gap over the next 10 years. This was updated in 2005 to \$4.1 billion over the 2005–2014 period. To raise this capital, property taxes in Edmonton would have to double or more (Vander Ploeg 2004a). Not only would such a move amount to political suicide, it would represent a failed opportunity to address some of the key drivers that are producing infrastructure deficits and debt.

Admittedly, the estimates of the infrastructure debt may be inaccurate. Nonetheless, there is broad agreement that a large debt exists, that it is growing, and that traditional approaches to infrastructure financing, funding and delivery are incapable of addressing it. It has also been argued that the infrastructure debt threatens Canada's future economic prosperity and quality of life (Gibbins, Berdahl, Vander Ploeg 2004). Hence, the appeal of innovative infrastructure finance.

The insufficiency of current approaches to address Canada's urban infrastructure shortfalls is not the only reason that innovative finance is necessary. A second reason Canada must look to innovative finance is that it is needed to address the root causes of infrastructure deficits and debt. (For an overview of the root causes of infrastructure deficits and debt, see pages 12 and 13.) Approaches that fail to address the primary drivers of annual infrastructure funding shortfalls (deficits) and the accumulated backlog of needed investments (debt) will provide only short-term relief. Traditional responses geared to cutting spending and hiking property taxes are not a sustainable solution. What is needed are alternatives that directly respond to the core of the infrastructure issue and provide long-term solutions.

To this end, innovative infrastructure finance has the following objectives:

Increased revenue. Innovative infrastructure finance seeks to grow the pool of resources available for infrastructure by increasing the revenue yield of traditional or existing finance

tools or securing funds at the lowest possible cost. This is typically accomplished by changing the way these tools are used, and thus overcoming certain political challenges or barriers to their increased usage. Innovative infrastructure finance also attempts to make more efficient use of existing sources of revenue by leveraging external revenue sources such as federal and state/provincial grants. Finally, innovative infrastructure finance seeks out new avenues of funding to supplement the existing basket of infrastructure financing sources. The overall aim of innovative infrastructure finance from this perspective is to increase the fiscal space within the capital budget envelope by securing additional revenue while maintaining overall fiscal discipline.

Improved cash flow. Innovative infrastructure finance is not just about increasing revenue. Innovative infrastructure finance tools place a premium on flexibility in an attempt to provide better up-front funding for infrastructure projects, overcome problematic and recurring short-term cash flow shortages, and improve long-term cash flow performance and management. In this context, the aim of innovative infrastructure finance is to improve overall cash flows, but not necessarily increase the total available funding. Better cash flow management, for example, can accelerate the implementation of infrastructure projects that are blocked by a lack of funds in the short-term.

Multiple policy objectives. An important, yet often overlooked, objective of innovative infrastructure finance is how certain tools provide additional funds while also serving other policy objectives. For example, some tools help reduce the *demand* for infrastructure as well helping to finance or fund an increase in the *supply* of infrastructure. Innovative infrastructure finance can help promote environmental conservation, reduce urban sprawl, and ensure better fairness and equity in the provision of urban services.

Economic sustainability. Innovative infrastructure finance is also very much about economically sustainable solutions to infrastructure issues. For example, some tools are better geared toward managing the costs of capital assets across their whole life cycle, ensuring adequate financing and funding over the long-term (including preventative maintenance). In this sense, innovative infrastructure finance can be seen as a complement to an overall capital asset management strategy that focuses on the long-term as

The Root Causes of Infrastructure Deficits and Debt

The Canada West Foundation's *No Time to be Timid* report outlines 10 specific drivers of urban infrastructure deficits and debt:

1) Urban population growth and outward physical expansion. In the short-term, population growth drives the need for more infrastructure. It also creates a significant long-term burden in the form of a large future financial liability.

The pattern of growth is also a problem. Much has been written about the effects of urban sprawl and how it dramatically increases the cost of infrastructure. Even more troubling is the fact that a good portion of urban growth continues to occur in metro-adjacent areas—the urban and rural fringes surrounding Canada's large cities. This presents a particularly daunting challenge in that infrastructure has to be provided to a growing population that pays its residential property taxes elsewhere.

2) Infrastructure systems are aging. Much of Canada's public infrastructure was put in place between the end of WW II and the mid-1970s. At present, Canada is entering an era where a growing proportion of its public infrastructure is completing its first full life-cycle. Almost 30% of Canada's total public infrastructure is over 80 years old, and only 40% is under 40 years old. It has also been suggested that Canadians have used, on average, almost 80% of the useful life of all public infrastructure in the country (Canadian Society of Civil Engineering 2002). An aging public capital stock implies the need for more dollars because older infrastructure is more costly to maintain than new. It also implies the need for better asset management strategies. The natural aging process of infrastructure has been compounded by a lack of previous investment in maintenance and renewal. This deferred maintenance has accelerated the aging of infrastructure and its accompanying deterioration, and once deterioration sets in, it continues to compound almost exponentially. Along with escalating costs, the infrastructure becomes more difficult to satisfactorily repair and rehabilitate.

3) Rising standards. Standards for infrastructure and municipal services have significantly changed over the years, particularly as they relate to protecting the health and safety of individuals and the environment. Rising standards can result in the need for new infrastructure projects and/or upgrades.

4) Lack of correct pricing. Many municipal services are under-priced relative to the total costs of providing the service, or are priced incorrectly to individual users (Vander Ploeg 2002a). Many municipal services are funded by property taxes or a system of centralized financing. Because costs are shared, there is no incentive to reduce individual consumption, which leads to higher total costs and artificial demands for more infrastructure and services (Groot 1995).

User fees are not always employed to accurately price the cost of services, but are often used to simply raise revenue (Kitchen 1993). For some services (e.g., recreation centers and libraries), user fees fail to recover total costs. For other services (e.g., water and sewer), user fees do yield full cost recovery but the price charged is a flat fee that ignores the differential costs of providing the service to specific individuals or properties. Further, many municipal user fees do not take into account the additional costs of providing certain services during peak demand periods.

Finally, some suggest that the price of developing urban fringe land has been too low—well below the full cost of extending utility and transportation infrastructure and even providing fire and police protection. Some of these costs have been subsidized by taxpayers living closer to the city centre (Thomas 1981).

5) Fiscal restraint and recession. The most immediate reason for infrastructure deficits and debt relates to fiscal restraint in the late 1980s and early 1990s on the part of federal and provincial governments. This period of prolonged belt-tightening occurred on the heels of a rather deep economic recession. Successive federal budgets, which had become increasingly absorbed by high interest payments on debt, were marked by significant reductions in provincial transfers, which eventually found their way to municipalities in the form of less provincial support for both operations and capital projects.

The result was a significant fiscal shock for municipal governments. Capital grants, which used to be the financial bedrock for most large municipal capital projects, were severely scaled back, and even today, intergovernmental capital grants tend to be smaller and more sporadic (Federation of Canadian Municipalities 2001). Cities are simply more reliant on their own sources of revenue, which tend to be relatively narrow.

This fiscal restraint occurred at a time when cities were growing and the need for infrastructure investment was rising. While the fiscal deficit has been closed, an infrastructure debt has opened, and the effect of previous budgetary restraint measures continues to be felt. A lack of long-term planning has resulted in an ongoing cycle of build and replace that continues to monopolize budgets at the expense of maintenance (Vanier 2000).

6) Competing budget priorities. Since the 1970s, regular maintenance of existing infrastructure and new investments have had to compete with other priorities that were either unavailable 50 years ago or that have become much more expensive. In the current fiscal and political environment, federal and provincial governments remain fixated on tax cuts and reduced public debt, or expanded spending on health care and education. In fact, the bulk of new federal and provincial government spending has largely been allocated to health care, and to a lesser extent, education. Health care spending is rising at a rate greater than inflation and it is also consuming an increasing portion of provincial budgets, leaving little room for infrastructure. For many cities, this is compounded by past federal and provincial downloading and offloading of certain services (e.g., affordable housing), which has added a list of new competing priorities for limited property tax dollars to municipal budgets. The net effect is a chronic deficiency in capital budgets (Poisson 2002).

7) Heavy reliance on the property tax as opposed to tax revenue diversity. Compared to both their American and European counterparts, Canadian cities are heavily reliant on the property tax. An over-reliance on the property tax creates at least seven problems related to infrastructure: (1) time lag between infrastructure need and property tax revenue collection; (2) highly visible, inelastic and politically unpopular tax means that politicians are hesitant to adjust tax rates to ensure sufficient revenues; (3) slow property tax revenue growth limits municipality's ability to debt-finance capital expenditures; (4) non-residents who use infrastructure do not contribute to property tax; (5) property tax administration rarely reflects variable costs of servicing different properties; (6) differential effective tax rates for certain classes of properties promote urban sprawl and over-consumption of services, thus driving demands for more infrastructure; and (7) over-reliance on property tax may constitute hidden disincentive for infrastructure investment (see Manitoba Heavy Construction Association 1998b).

8) Changing attitudes toward municipal debt. From the 1950s to the late 1970s, borrowing constituted a very important source of capital financing for most cities (Vander Ploeg 2003). Since then, cities have become increasingly reluctant to borrow. Part of the reason stems from the spectacular spike in interest rates during the early 1980s, and the roller-coaster ride of financial markets since then (Mirza 2003). However, this generally negative view of taking on more debt was not the end of the matter. Many cities also embarked on a structured program to reduce their debt loads, especially tax supported debt.

As a result, many cities began following a strict pay-as-you-go approach to financing all tax supported infrastructure, including major roadways and even transit expansion. But moving from debt financing to a complete pay-as-you-go is no easy assignment. At the same time that capital reserves and current revenues are needed to finance capital, funds are still tied up servicing the principal and interest on the outstanding debt. As debt is repaid, only small incremental increases in pay-as-you-go funding become available from the reduced debt charges. As a result, many cities deferred the necessary investments in the municipal capital stock.

9) Inadequate infrastructure management. Instead of considering the commitment needed to maintain infrastructure across its entire lifespan, governments tend to consider only the up-front costs of construction. This lack of considering infrastructure requirements and performance over the full life-cycle has encouraged governments to take on new construction at the expense of properly maintaining existing infrastructure and facilities (Vanier 2000).

The effect of this oversight is serious, and has led to three particular problems. First, governments have over-built in the sense that they have more infrastructure and facilities than is realistically affordable. This is not to imply that the infrastructure is not needed, but it reveals that governments lack the resources for the full maintenance and repair of what they own. All of this leads to the second problem—an accumulating maintenance deficit. This produces premature renewals of the infrastructure and periodic failures (Vanier 2000). Finally, this on-going practice of designing and building systems without explicit consideration of the regular investments needed to maintain and replace it has resulted in an aging and deteriorating capital stock.

10) Public accounting practices. Most municipalities employ a form of cash accounting that requires all capital expenditures to be fully expensed in the year that they are made. Analysts suggest this has two effects: 1) Under a system of cash accounting, if a large portion of annual capital expenditure is financed by borrowing, the result could be a significant budget deficit at the end of the year. This serves as a disincentive to embark on capital projects (Mintz and Preston 1993). 2) The practice of fully expensing capital in the year of acquisition, and the subsequent failure to depreciate the value of capital assets and include this as a cost to be recovered, has led to a misallocation of investment (Kitchen 2003).

opposed to the short-term. Examples include innovative financing and funding tools that promote the self-funding of infrastructure through user pay systems and comprehensive pricing and tariff structures as opposed to the traditional tax and spend option. The greater degree to which a financial tool allocates the costs of infrastructure among its various users, and the greater degree to which it establishes a link between those who benefit from the infrastructure and those who pay for it, the more sustainable municipal infrastructure investments will become.

Accountability, transparency, and enhanced service. A key goal of innovative infrastructure finance is better public oversight, accountability, visibility, and transparency in the financing, funding and delivery of public infrastructure, as well as its future performance. As part of this general thrust, many tools are geared toward providing governments with a feedback mechanism that improves their ability to respond to changes in demand and to determine how and when to provide infrastructure.

3. Matching Tools to Infrastructure

Infrastructure is not an end in itself. It is the means of delivering the goods and services that facilitate economic prosperity, ensure the health and safety of citizens, and enhance quality of life.

Figure 3 presents a list of the infrastructure assets typically found in large urban areas. Before deciding how best to finance, fund, and deliver an asset on the list, its basic characteristics need to be identified:

Size. Municipal infrastructure runs the full gamut from huge roadway interchanges to tot lots. The size of a project will affect everything from the need for feasibility studies and environmental assessments to the size and sophistication of the construction crews needed to complete the project.

Complexity. Building and maintaining a water treatment facility is more complex than building and maintaining a parking garage.

Up-front costs. Large and complex infrastructure projects often have high up-front costs.

Creating Fiscal Space

Fiscal space is defined as room in a government's budget that allows it to provide resources for a desired purpose without jeopardizing the sustainability of its financial position or the overall stability of the economy. There are only a few methods of accomplishing this objective:

- a government can re-prioritize its expenditures by cutting spending in some areas and boosting it in others;
- a government can secure cost savings by improving internal efficiencies or reforming service delivery;
- a government can raise revenue by increasing existing taxes or implementing new taxes;
- a government can increase its borrowing; and
- a government can employ the private sector to borrow and construct assets or deliver services on its behalf.

The last two options, however, may or may not increase fiscal space since principal and interest repayments always have first claim on all future revenues. In the case of private sector involvement, governments essentially commit themselves to a set of future liabilities through a long-term contract to compensate the private partner for the capital invested and the risk assumed. Thus, fiscal space is created in the short-term, but not necessarily in the long-term.

To preserve fiscal space, governments can facilitate the construction of infrastructure and the delivery of services through self-financing user pay systems. This is, in effect, the provision of a public infrastructure system and a corresponding service that can be delivered on a purely commercial basis for which a ready market exists. Individuals pay the tariff or fee because the infrastructure is highly valued and they draw a personal financial benefit from it. The revenues are provided by the increased spending of users of the infrastructure with minimal impact upon a government's budget dynamics.

In the end, innovative infrastructure finance is about finding creative ways for governments to create additional fiscal space within their budgets. Thus, the concept speaks to a wide range of public finance issues including the reform of government service delivery, new tax tools, and public-private partnerships.

Source: Adapted from Heller 2004 and 2005.

Construction time. Large and complex infrastructure generally takes more time to plan and construct. With particularly large projects, it is not unreasonable for planning, design, and construction to spread over several years and multiple budget cycles. When combined with high up-front costs, this means committing large sums of money for an extended period of time without receiving any offsetting revenue during the construction and start-up phases. As a result, large projects often need to arrange bridge financing during construction when cash flows become pressed, and they also involve significant risk in terms of potential cost over-runs.

Asset life. Infrastructure assets are traditionally viewed as having a long lifespan, and this is indeed the case for underground watermains, wastewater lines, and storm drainage systems. However, lifespan varies according to asset type. For example, pavement comprises the single largest proportion of a city's financial investment in physical infrastructure, but its lifespan is generally restricted to a few decades, and even less if usage is heavy. Likewise, municipal vehicle fleets have a relatively short lifespan. On average, buildings have a functional life of about 50 years, and commentators suggest that this represents the average across the full spectrum of urban infrastructure assets. Highly specialized or technological infrastructure carries its own particular risk—these assets can remain functional for a long time, but technological innovation can cut this lifespan short, rendering them obsolete.

Future commitments. Capital investment is sometimes perceived as a one-off expenditure—once the up-front capital has been spent, little else is required. This makes sense for some, but not all, assets. For example, individual road signs require very little maintenance—the sign either works and is left alone, or it fails and is replaced. Most assets, however, require some level of ongoing maintenance. Paved roadways, for example, are very dependent upon a careful and consistent maintenance program. Assets differ with respect to how much they will draw on future operating budgets, but very few imply no future draw at all.

Payback period. A large project with high up-front costs, a relatively long life span, and the need for operational and maintenance funding means a significant period of time must elapse in order to recover the initial capital cost. These types of infrastructure involve high sunk costs.

Marketability. A critically important characteristic is whether an infrastructure asset and its corresponding service can produce sufficient cash flow to be self-funding (marketable), or whether it must be supported by government involvement through a tax subsidy (non-marketable). The financing and funding of a marketable asset is relatively easy because it pays for itself. Marketable infrastructure can also be provided privately.

While it is generally assumed that most infrastructure is non-marketable, this is not necessarily the case. City-owned golf courses are clearly marketable given the abundance of privately-owned alternatives. Other marketable urban infrastructure includes water and wastewater service. Some roads can also be marketable. For example, severe congestion along an existing roadway implies significant demand for new capacity. If that demand is coupled with the ability to identify and charge individual users, a new tolled roadway can be constructed that is completely self-funding—enough users are willing to pay a toll that is sufficient to cover the financing of the project as well as ongoing operations and maintenance. The users are more than willing to pay because they draw a benefit from the new tollway. This benefit comes in the form of less gasoline to purchase, less wear and tear on their vehicle, and less time spent on the road. In short, the benefits and conveniences of the new road more than offset the cost of paying the toll.

Determining whether an infrastructure asset is indeed marketable is not straightforward. The exercise involves significant economic and fiscal analysis of a number of key factors, including the public or private nature of the good, the presence of external benefits or costs, demand elasticity, and economies of scale. At the same time, increasing expertise with public-private partnerships (PPPs or P-3s) is demonstrating that infrastructure is not a monolithic entity that is always non-marketable in nature.

Priority. Due to a shortage of revenues, the capital budgets of most cities tend to split future infrastructure needs into high versus low priority projects. Arguably, projects with a higher priority designation, if they are also viewed as such by the public at large, are easier to finance and fund, particularly if that involves the issuing of debt or a property tax increase. High priority projects may also more easily lend themselves to unconventional forms of financing, funding and delivery.

FIGURE 3: Urban Infrastructure Assets

TRANSPORTATION INFRASTRUCTURE

Roadways:

Urban Expressways
 Major Arterial Roads
 Minor Arterial Roads
 Collector Roads
 Local Streets
 Gravelled and Paved Back Alleys
 Major Interchanges
 Overpasses/Underpasses
 On and Off-ramps/Merge Lanes
 Major/Minor Intersections
 Rail Crossing Infrastructure
 Gates (e.g., vehicle traps)
 Bridges and Tunnels
 Culverts and Other Drainage
 Traffic Sound Barriers
 Traffic Signals and Systems
 Road Signage
 Curbs and Gutters
 Boulevards and Medians
 Streetscaping
 Streetlighting
 Road Striping and Marking
 Public Parking Garages
 Public Parking Lots
 Parking Meters
 Road Maintenance Fleet

Pedestrian:

Sidewalks
 Pedestrian Overpasses
 Pedestrian/Bicycle Pathways

Transit (General):

Fare Collection Equipment
 Ticket Dispensing Equipment
 Communications and IT
 Uniforms

Transit (Busing):

Buses and Related Equipment
 Shuttles and Vans
 Bus Stops and Shelters
 Turn-outs, Loops, Transfer Points
 Maintenance Garages and Equipment
 Transit Supervisor Vehicles

Transit (Light Rail):

Rail Cars
 Railbeds
 Electric Lines
 Train Signalling, Switching
 Train Stations and Parking Lots
 Access Platforms
 Underground Tunnels/Subways
 Bridges/Overpass/Flyovers

Other Transportation:

Multi-Modal Facilities
 Ports
 Harbours
 Waterfronts
 Municipal Airports

MUNICIPAL POLICING and BY-LAW ENFORCEMENT

Central Police Headquarters
 Branch Precincts and Local Police Stations
 Central Lock-ups
 Local Lock-ups
 Longer-Term Remand Centres
 Academy and Training Facilities
 Forensic/Crime Labs and Equipment
 Firing Range Facilities
 Vehicle Impound Lots
 Animal Pound Facilities
 Vehicle Maintenance Facilities
 Police Cruisers
 Police Trucks and Vans
 Mobile Command Centre Vehicles
 Motorcycles
 Bicycles
 Horse Mounts
 Helicopters
 By-Law Enforcement Vehicles
 Specialized SWAT Vehicles
 Specialized SWAT Equipment (e.g., firearms, night-vision)
 K-9 Units and Related Equipment
 Uniforms
 Firearms (handguns, rifles, shotguns)
 Other Equipment (e.g., tasers, restraints)
 Mobile Communications Equipment
 Computers and Related IT
 Audio/Video Surveillance Equipment

EMERGENCY RESPONSE (FIREFIGHTING and EMS)

Fire Fighting:

Fire Halls and Local Stations
 Firefighting Training Centres
 Mobile Command Centre Vehicles
 Aerial Apparatus and Related
 Pumper Apparatus and Related
 Tanker Apparatus and Related
 Specialized Rescue Vehicles and Equipment
 Watercraft and Related Equipment
 Haz-Mat Units and Related Equipment
 Chief, Deputy Chief, Supervisor Vehicles
 Other Emergency Support Vehicles
 Inspector Vehicles
 Arson Investigation Equipment
 Specialized Communication Equipment
 Fire Fighter Uniforms
 Firefighter Turn-out Gear

Ambulatory and EMS:

Ambulance Stations (often joint-use with firefighting)
 EMS Ambulance Vehicles
 Transfer Ambulances
 EMS Supervisor Vehicles
 Paramedic Uniforms
 Specialized Paramedical EMS Equipment
 Communications Equipment
 IT Technology

URBAN PARKS and OPEN GREEN SPACE

Natural Open Park Land
 Landscaped and Groomed Park Land
 Municipal Cemeteries
 Horticultures (e.g., trees, bush, flowers)
 Unpaved Hiking Trails, Pathways
 Paved Trails and Pathways
 Pedestrian Bridges
 Hardsurfaces and Paved Parking Lots
 Playgrounds and Related Equipment
 Picnic Shelters, Tables, Grills, Fire-pits
 Park Benches
 Washrooms and Facilities
 Concession Stands and Outbuildings
 Parks and Recreation Fleet
 Lawnmowers, Trimmers, Other Equipment

RECREATION, LEISURE and TOURISM FACILITIES*Outdoor Recreation Facilities:*

Integrated Sportsfields (e.g., track, ball, soccer)
 Public Golf Courses
 Large Outdoor Pools/Waterslides
 Local Outdoor Pools and Splashparks
 Local Outdoor Ice Rinks
 Local Ball Diamonds

Indoor Recreation Facilities:

Integrated Leisure Centres (i.e., multi-purpose)
 Indoor Hockey Arenas
 Indoor Curling Arenas
 Indoor Swimming Pools

Larger Regional Recreational and Tourism Facilities:

Convention and Conference Centres
 Multi-Purpose Auditoriums
 Large Historical Attractions (e.g., Heritage Park)
 Metropolitan Zoos
 Metropolitan Aquariums
 Wild Animal Parks
 Science Centres
 Professional Indoor Sports Stadiums
 Professional Outdoor Sport Stadiums
 Local Exhibition Grounds
 Tourism, Information, Visitors' Centres

CULTURAL FACILITIES

Concert Hall Auditoriums
 Performing Arts and Theatrical Facilities
 Museum Facilities and Collections
 Art Galleries and Collections
 Central or Main Library Facility
 Branch Library Facilities
 Library Holdings and Collections
 Computers, Electronic Catalogues, Databases

COMMUNITY and SOCIAL SERVICE FACILITIES

Homeless Shelters
 Drop-in Centres
 Transitional or Temporary Housing
 Affordable and Community Housing
 Seniors' Lodges
 Addiction Mitigation Facilities
 Recovery and Treatment Centres

ENVIRONMENTAL INFRASTRUCTURE*Water Works:*

Source Infrastructure (e.g., rivers, wells, lakes)
 Source Control (e.g., weirs, dams)
 Water Treatment Plants
 Open Water Reservoirs, Storage Tanks, Basins
 Water Recharge, Water Pumping, and/or Flow Control Systems
 Trunk Mains (i.e., from treatment to reservoirs)
 Large Distribution Mains (i.e., trunk to small mains)
 Small Distribution Mains (i.e., small mains to service line)
 Service Lines, Local Connections, Service Line Water Shut-offs
 Water Meters
 Fire Hydrants
 Water System Fleet and Related Equipment

Wastewater and Sanitary Sewer:

Local Sewer Lines (often property owner's responsibility)
 Lateral Lines (i.e., small diameters)
 Branch Lines (i.e., medium diameters)
 Main Lines (i.e., bigger diameters with manholes)
 Trunk Lines (i.e., largest lines also with manholes)
 Intercept Lines (connect trunks to treatment plant)
 Lift Stations (pumping due to low gravity flows)
 Force Lines (special lines off a lift station)
 Wastewater Treatment Plants
 Sewer System Fleet (e.g., Vacuum Trucks)

Storm Drainage:

Catch Basin Inlets (i.e., debris control)
 Simple Inlets (i.e., no debris control)
 Storm Drainage Pipes, Systems, Manholes
 Effluent Discharge Infrastructure
 Storm Drainage Fleet

Waste Management:

Regional and Local Landfill Sites
 Refuse Transfer Stations
 Operations and Processing Facilities
 Vehicle Scales
 Specialized Hazardous Waste Storage/Disposal Facilities
 Recycling Depots, Collection, Separation, Storage Facilities
 Refuse Collection and Recycling Fleet
 Collection Containers and Miscellaneous Equipment

GENERAL GOVERNMENT and MISCELLANEOUS*Facilities and Buildings:*

City Hall, City Hall Annexes, Other Civic Offices
 All Other Municipally-Owned Buildings, Furnitures and Equipment
 Public Works Facilities (e.g., Garages, Yards)

Information Technology and Communications:

Main Frames and Personal Computers
 Main Servers and Computerized Networks
 Miscellaneous Communications Equipment

Miscellaneous Infrastructures and Assets:

Publicly-owned, Undeveloped Lands (i.e., for future growth, parks)
 Urban Brownfield Properties
 Properties and Lands From Tax Arrears

Landscaping:

Flood Protection, Mitigation, Embankments
 Erosion Controls
 General Grading
 Seawalls and Other Barriers

New construction or renewing existing systems. From a financing and funding perspective, new construction is likely easier to accomplish than refurbishing existing systems. The need to extend infrastructure services to accommodate growth is readily understood, and new infrastructure also allows elected leaders to receive political credit—an opportunity that does not always accompany the more mundane tasks related to improving existing infrastructure.

Integrated infrastructure or stand alone. Urban infrastructure assets can either stand alone (e.g., a museum) or form part of a much larger network (e.g. roads). Infrastructure assets that require integration with other assets need significant coordination, and therefore, are arguably more dependent upon government involvement. One of the challenges in applying innovative infrastructure finance is to learn specific strategies by which components of an integrated system can be creatively financed, funded, and delivered without compromising the interconnectedness of the overall network.

Hard or soft. A basic characteristic that cuts across most types of public assets is the division between hard and soft infrastructure. Hard assets provide a necessary foundation for economic functioning and development. Examples of hard infrastructure include roadways, rail, ports, water treatment and delivery, and wastewater treatment. Soft assets contribute to social policy or cultural and community objectives. Examples here include hospitals, primary, secondary, and post-secondary educational facilities, recreation centres, libraries, and museums.

Community-wide or localized. Some municipal infrastructure assets provide services to all residents, such as a large urban expressway or landfill. Other infrastructure serves a selected geographical portion of the city, such as the local recreation centre or outdoor ice rink. In addition, some municipal infrastructure assets provide services that extend beyond the community itself such as a convention centre.

User profile. It is important to know how and to what extent different groups will use an infrastructure asset. For example, will an infrastructure asset tend to be consumed by all residents equally regardless of socio-economic status? Will lower income individuals tend to consume more relative to higher

income users, or is it the reverse? In other words, what does the profile of a typical user look like? Such questions need to be answered before decisions on user fees, for example, can be made and subsequently defended.

Public awareness and demand. Some infrastructure projects are of more interest to the public or in higher demand than others and this will affect the degree to which an innovative approach is monitored by the media and the public.

Regulatory context. Urban infrastructure assets can either exist within a highly regulated environment or they can be provided by municipalities under conditions which are more flexible and open to local preferences. For example, relatively few provincial and federal regulations affect the construction of an outdoor ice rink or a small neighbourhood park. However, when it comes to major environmental infrastructure such as water and wastewater treatment or refuse disposal, regulations become much more important. The choice of various financing, funding and delivery options cannot ignore the question of regulation, particularly when standards are set by other orders of government.

Until the 1980s, governments across the world heavily regulated many aspects of their economic infrastructure, including transportation (e.g., rail, trucking, air transport), energy (e.g., electrical generation and transmission), and telecommunications. Many countries since then, including Canada, have opted to de-regulate these sectors and open them to competitive forces with less public oversight. The same trend does not apply equally to municipalities, which are often subject to a high degree of outside regulation. As discussed in later sections of this report, some tools offer significant potential in meeting the challenges associated with maintaining standards.

To summarize, there are many different kinds of municipal infrastructure assets—from roads and public transit systems to recreation centres, parks, and water treatment plants. Infrastructure can also be classified based on its key characteristics—large versus small, simple versus complex, and so on. Identifying and understanding the implications of these characteristics is key to selecting the right tool from the infrastructure finance toolkit.

Marketability and Non-Marketability

The standard approach to infrastructure has generally been to emphasize its non-marketability and its natural monopoly characteristics. Because infrastructure often involves goods and services that possess a strong public good component, there is a degree of market failure involved. Thus, infrastructure provision is efficient only when delivered by a single provider. Typically, this takes the form of government delivery through taxation. Private provision through user fees is a possibility, but the private firm must be heavily regulated to ensure universal provision and guard against price gouging. However, market failure should not be simply assumed. The degree to which an infrastructure asset and its corresponding service is truly non-marketable depends on four factors.

- 1) Public Goods, Private Goods, Quasi-Public Goods, and Merit Goods: Public goods are non-exclusive (it is difficult, expensive, or impractical to exclude those who refuse to pay) and non-rival (additional users of the infrastructure do not hinder the benefits that flow to existing users). Private goods entail the opposite. In reality, there are very few pure public goods (e.g., national defense, an open access park) or pure private goods (e.g., groceries). Rather, most goods tend to be quasi-public or merit goods. Quasi-public goods involve some non-excludability and non-rivalry, but they also yield substantial individual benefits (e.g., water treatment, highways). Merit goods provide significant benefits to individuals and society as a whole (e.g., education, museums, theatres). Government often involves itself in the provision of quasi-public and merit goods because consumption would be too low if individuals were to pay the full cost themselves.
- 2) Externalities: The presence of external costs and benefits is a major reason behind market failure. An open market economy will tend to over produce goods and services that impose external costs on others, and under produce those that generate external benefits. In other words, some infrastructure goods and services with a strong public good component provide significant spill-over benefits to other persons, whether or not they pay for those benefits. This makes it difficult for the private sector to recoup capital costs and operational expenses. Thus, some level of government involvement is required to ensure adequate levels of provision at a reasonable price.
- 3) Inelastic Demand: The services provided through some forms of municipal infrastructure are often essential in nature, with very few substitutes. Because there are few practical substitutes for clean water, waste treatment, and the public roadway, demand for these goods and services is relatively inelastic—demand tends to be insensitive to changes in price or cost.
- 4) Economies of Scale: Infrastructure that carries a number of the features outlined above can combine with economies of scale. For example, large systems with high initial capital costs and long payback periods act as a barrier to multiple private sector firms entering the market. The costs of duplicating these huge systems prevents competition, thus producing a natural monopoly situation.

Public goods, externalities, inelastic demand, and economies of scale have led many to claim that infrastructure services are best provided by government. This view prevailed until the 1980s, but the consensus has since broken down (Dowall 2000). In many instances, governments have succumbed to a certain level of confusion concerning the public nature of the goods and services they provide. Is a golf course really a public good or merit good that demands public delivery? What about the new ring-road being constructed around Calgary? Must this road be paid for by taxes? Or, could it be tolled—either partially or completely?

The fact is, most infrastructure, goods, and services provided by government are quasi-public or merit goods—from the public roadway to post-secondary education. All tend to provide significant private benefits, and also benefit society. With these types of goods, choices must be made concerning financing, funding and delivery. With post-secondary education, for example, students pay a portion of the costs themselves through tuition, while government funds the rest with tax revenue. This approach represents the quasi-public nature of education, realizing that it benefits individuals as well as society.

Prior to making a decision regarding infrastructure financing, funding, or delivery, policy-makers need to assess carefully the degree to which these four characteristics define the particular infrastructure project or municipal service. It must not be assumed that public delivery through taxation is the only way to proceed, even if that represents the easiest alternative. The fact is, some infrastructure assets and services are indeed quite marketable, and to assert that infrastructure by its very nature involves a public good, is muddled thinking. Rather, most infrastructure goods and services benefit individuals just as much as they benefit society, and appropriately dividing the costs among individuals and all members of society is a key consideration when deciding to pursue certain innovative finance options.

Assessing Infrastructure Finance Tools

Earlier in this report, a taxonomy of infrastructure finance tools was presented (see Figure 1). These tools must be considered in light of the key characteristics of the infrastructure to which they may be applied. Indeed, the key characteristics of infrastructure are critical to determining the applicability of a particular innovative financing, funding or delivery tool.

Figure 4 depicts the interface between the key characteristics and the range of available approaches, including examples of the traditional and innovative tools that may be applied. By so doing, Figure 4 highlights the complex relationships that must be considered when deciding how to finance, fund, and deliver infrastructure and the series of decisions that must be made. Indeed, working through the elements outlined in Figure 4 is a prerequisite to sound public policy in this area and, in turn, a fundamentally important winning condition for innovative infrastructure finance.

How should the up-front capital cost be secured? The point of Figure 4 is that the answer depends on the key characteristics of the infrastructure asset involved. Is the asset under consideration a small project with a short lifespan and payback period? Or, is the asset a large project with a long lifespan and payback period? The answer determines where the lever should be set between pay-as-you-go and debt financing. This question must be answered before selecting a specific pay-as-you-go or debt financing tool.

How should the financing be repaid or the up-front costs funded? Again, the characteristics of the infrastructure guide the answer. Will the infrastructure yield measurable benefits to individual users and can those users be easily identified? In other words, is the infrastructure marketable? Or, does the infrastructure involve a clear case of market failure? Will usage of the infrastructure and its corresponding service be more heavily used by those with lower incomes? If the latter two conditions apply, the lever should be set toward taxation as the funding source. If the former conditions apply, then the lever should be set to user fees. Again, particular user fee and taxation tools would also need to be selected.

How should the infrastructure be delivered? Is the infrastructure a hard economic asset? Is it a stand-alone asset? Or, is it a

soft social infrastructure asset? Is the asset part of a highly integrated system? If the former two conditions apply, then the private sector may have a strong role to play. If the latter two apply, then there is a strong argument for public delivery. As is often the case, it might be a little of both. This opens the door for a public-private partnership model, which forces a range of other decisions that need to be made. How much private involvement is sought in terms of design, construction, financing, operation, and even ownership?

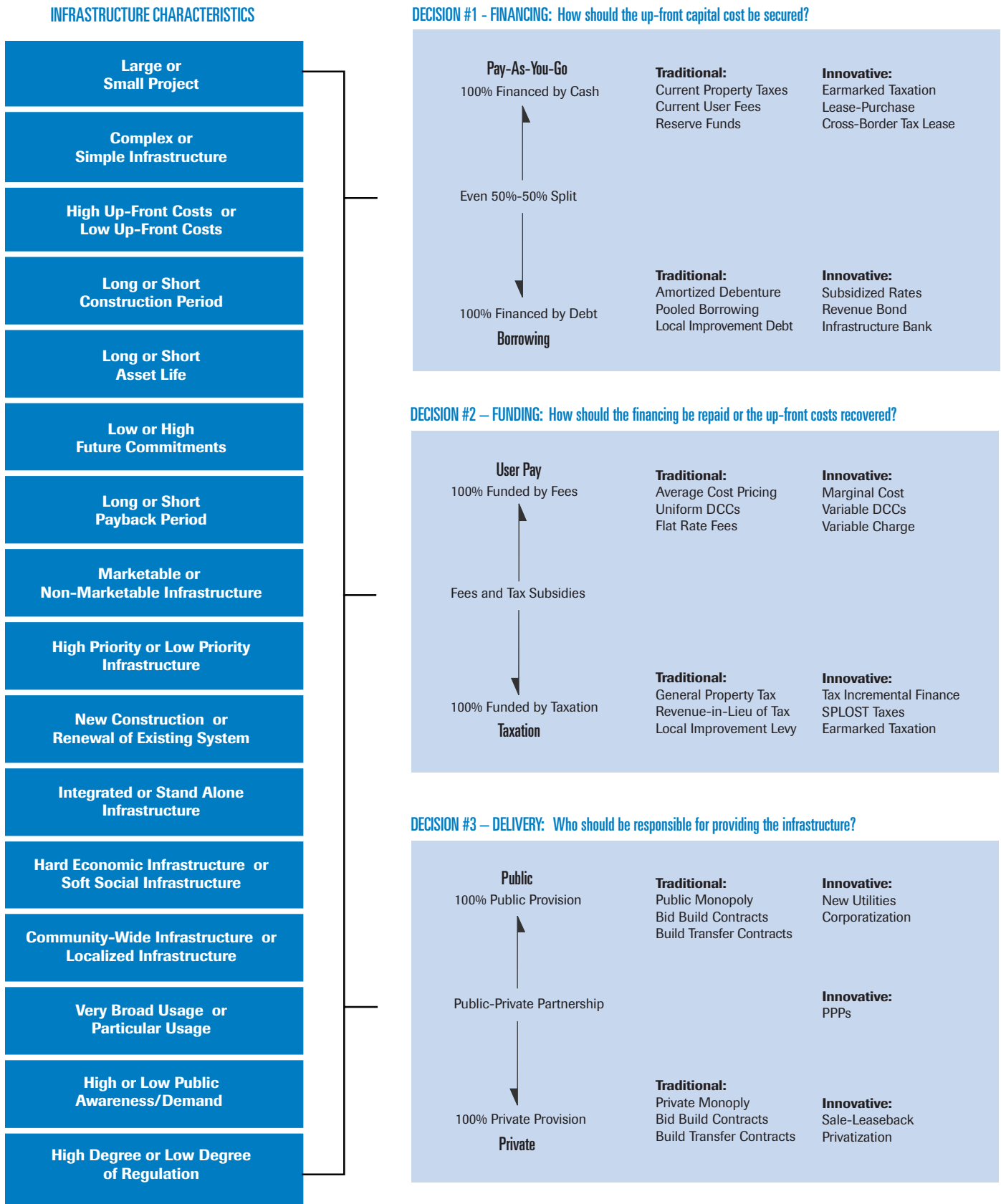
The approach conceptualized in Figure 4 can be demonstrated by using the following example. Assume a new urban expressway is to be built alongside an existing route that is suffering from severe congestion. The new expressway is a very large project. The city wants to take advantage of new intelligent transportation system (ITS) technology. This will make the new asset quite complex. The expressway involves high up-front costs and a long construction period. The interchanges for the new expressway are good for at least 50 years or more, but the paved sections of the roadway will only have a long asset life if they are regularly maintained. This entails a significant future revenue commitment for maintenance. Because of the sheer size of the project, there will be a long payback period.

However, there is significant and strong demand for the new route. New electronic toll collection (ETC) technology will enable individual drivers to be identified when they merge onto the roadway. As such, the proposed asset appears to be quite marketable from a demand and user point of view. The project is a high priority and will yield an entirely new asset. The asset is clearly a case of hard economic infrastructure that will benefit the entire city, but those benefits will also flow to individual users, particularly businesses that are exporting goods out of the city and the travellers and commuters who come into the city on a daily basis. The new expressway, like all such projects, needs to meet or exceed provincial transportation standards.

But, there is a problem. The city has no money, there is significant tax supported debt on the books, and voters are already complaining about high property taxes. Yet surprisingly, the project is going ahead. How is this possible?

In this hypothetical case, the characteristics of the urban expressway combine to form the ideal project for debt-financing, user fee funding, and delivery through a public-private partnership (PPP). The large size, high up-front

FIGURE 4: The Interface of the Key Characteristics of Urban Infrastructure and the “Rule of Two”



The Other Side of the Equation: Infrastructure Demand Management

Assessments of public infrastructure tend to focus on various ways and means to increase the supply of infrastructure as opposed to finding effective ways to reduce demand (Dowall 2000). Supply certainly dominates the discussion in Canada. This report continues this trend by identifying a host of new ways to finance, fund and deliver more infrastructure, but there is also a range of demand management strategies that should be considered. Usage of these demand management tools will complement the innovations outlined in Part II of this report.

Strategic capital asset management. One of the drivers behind infrastructure deficits and debt is a misunderstanding of the life-cycle demands of existing infrastructure. Strategic asset management addresses this deficiency by creating a clear vision of the big picture and what is needed to protect and enhance the performance of existing infrastructure assets. Proper asset management conducted at the macro level attempts to eliminate the disconnect between technical planners and financial decision-makers by breaking down silos that work against sustainable asset management, and linking strategic infrastructure management across the municipal operation to financial planning.

Strategic management of existing assets incorporates six steps that require the production and analysis of specific data to measure more accurately infrastructure needs and to manage those needs: 1) development of an inventory of all infrastructure assets across the operation; 2) determination of the replacement value of infrastructure assets using current construction costs; 3) assessment of the condition and age of existing infrastructure; 4) identification of the types of spending required; 5) creation of a time line of when expenditures need to occur; and 6) assessment of the future costs required to preserve and service individual aspects of existing infrastructure assets (Vanier 2000; RV Anderson and Associates 2002). The data requirements for proper and comprehensive strategic asset management are intense—they demand the collection, production, and analysis of significant amounts of information from across all municipal departments and functions. But, when it comes to infrastructure, it is vital; what cannot be effectively measured cannot be managed.

Maximize existing capacities. Wherever possible and practical, multi-purpose facilities should be considered for a wide variety of public as well as private uses. Coordinating infrastructure investments that meet the mutual needs of adjoining municipalities throughout a city-region can be accomplished by collaborative capital planning, shared construction, and shared usage of facilities and related infrastructure. Facilities that experience regular peaks and troughs in demand can be made available for alternative uses. Public agencies from different orders of government can also join together in the blended financing of projects that serve both parties—a public-public partnership. Closer partnerships can also be constructed around the idea of joint public-public development.

Infrastructure demand management strategies. Managing infrastructure demand and usage through strategies such as high occupancy vehicle (HOV) lanes during peak periods, traffic calming and the implementation of reverse lanes is a basket of alternatives already in play in many Canadian cities. These strategies are intended to manage rapidly growing transportation requirements without expanding the supply of infrastructure. Other ideas include corporate transit discounts, rewards for corporate van pooling, and Internet-based car pooling. The effectiveness of these strategies bumps up against

the lack of pricing, and therefore can only do so much. However, some can achieve measurable results until more rational pricing schemes can be developed and implemented.

Reform of standards. Standards in infrastructure provision could be developed to accommodate better the current fiscal situation of many governments and their inability to fund new additions to the capital stock adequately and rehabilitate the existing stock of assets. Issues of quality control, uniformity, and standards to secure public safety are not compromised when the standards emphasize functionality over other considerations.

Accrual accounting. Many analysts argue that governments should employ accrual accounting such that capital assets are amortized over their expected life rather than expensed in the year of purchase (Kitchen 2003). This provides a better matching of the consumption of assets with the costs recorded on the books. While depreciation is a non-cash item, if funds equivalent to the depreciation amount are set aside every year over the life of the asset, there will be enough money saved after the asset is completely depreciated to cover the costs of replacement. The intent here is to disclose to the public the real costs of providing infrastructure, and it will help governments ensure their infrastructure is financially sustainable (Brittain 2002).

The Public Sector Accounting Board (PSAB) of the Canadian Institute of Chartered Accountants (CICA) is currently exploring the issue. PSAB released a government reporting model in 2002 and started a project examining the accounting of capital assets by local governments (Brittain 2002). Ottawa has recently moved to implement elements of accrual accounting requiring the depreciation of its capital assets. While this has not generally been adopted by municipalities, it makes considerable economic sense (Kitchen 2003).

In the end, the issue of accounting in the public sector is very much a trade-off. Cash accounting removes a lot of the fog from public financial statements and is quite easy to understand. Accrual accounting is not as straightforward, and may present opportunities to manipulate the process of writing off capital assets. It is difficult to ascribe a value to assets for which there is often no real market (Kitchen 2003). Methods of accounting in the public sector can be controversial since some approaches, like accrual accounting, alter the government's financial position at year end, and impair the public's ability to judge affordability. Improvements in accounting practices today will not help solve problems that go back 20 or even 50 years, but they may offer a better way forward for infrastructure in the future.

Activity-based accounting. The collection of capital cost data is an essential element of managing infrastructure over the long-term and moving toward better models of infrastructure pricing. Unfortunately, many governments do not have a good handle on the actual costs of infrastructure. If PPPs and more rational pricing are to be pursued in the future, then work must begin now on gathering these data or developing financial models that can provide an estimate of the costs. Such activity-based accounting is a first step in better managing the future of infrastructure.

Infrastructure demand management has the potential to help address the infrastructure challenges faced by Canada's large urban areas by reducing stress on existing systems and reducing the need for new infrastructure. These demand management tools should be a key part of any city's infrastructure plan. In addition to reducing demand, these tools may facilitate the effective use of the tools designed to finance, fund, and deliver an increased or improved supply of infrastructure.

costs, long asset life, and long payback period all support a debt-finance approach. The expressway is also a clear form of hard economic infrastructure, and it provides considerable private benefits to individual users. It is also marketable. As a result, the asset is a prime candidate for user fee funding, particularly since it is a new project—those who cannot afford the toll can continue using the tax supported existing route. The marketability of the asset combines with significant technological requirements, a long construction period and significant future maintenance commitments. Since all of these risks are arguably better managed by the private sector, the PPP approach makes considerable economic and fiscal sense. The project is also high priority and stand-alone in nature, further strengthening the case for a PPP approach.

In terms of specific tools, the hypothetical expressway would be very innovative if it employed revenue bonds from international capital markets and if the tolls were a volumetric charge (based on length driven) that varied according to time of day (peak period pricing). The icing on the cake would be a DBFOOT public-private partnership, where the private partner *Designs, Builds, Finances, Owns, Operates*, and then *Transfers* the asset back to government after the concession period has expired.

The characteristics exhibited by an infrastructure asset must become a primary consideration driving the selection of core methods and specific tools for financing, funding and delivery. In short, financing, funding and delivery must be matched with the key characteristics of the infrastructure asset in question. The decision matrix depicted in Figure 4 provides a checklist that decision-makers can use to ensure that they have the information needed to make a logical match.

4. Winning Conditions

In addition to understanding the elements outlined in Figure 4, there are a number of winning conditions that allow for the uptake of innovative infrastructure finance and enable it to flourish. While each major tool has its own set of winning conditions (detailed in Part II), the concern here is uncovering some of the most important core winning conditions that facilitate innovation more broadly speaking.

First, it is important to understand that Canada's municipalities exist within a highly regulated framework that precludes the usage of many innovative options. As such, changing the

legislative environment and unleashing cities is a prerequisite. This, in turn, depends on the ability of governments to cultivate a culture of innovation and creativity, and place a premium on flexibility and the freedom to innovate. Across the world, the uptake of many innovative infrastructure finance approaches started at the local level, but was only made possible when a change in thinking also occurred at higher levels of government.

Second, there must be at least some sense of crisis surrounding the infrastructure issue within the broader political and economic environment. Wholesale changes in how infrastructure is financed, funded, and delivered will only be considered by governments and accepted by the public at large when there is a sense of urgency attached to the matter, and a realization that the situation will worsen considerably without immediate action. In the absence of a sense of urgency, it is difficult to formulate a rationale for change that will be readily accepted—the focus will remain on the quick-fix rather than pursuing fundamental reforms that address the roots of the problem. A sense of urgency is necessary if general institutional inertia and public conservatism is to be overcome, thus opening the door for more innovative approaches.

Third, a consensus must emerge that current approaches are simply inadequate to the task at hand. This consensus must go beyond a simple recognition that traditional approaches fail to provide sufficient revenue for infrastructure. The consensus must also recognize that traditional approaches amount to a set of financial incentives that have fuelled unnecessarily high demand for infrastructure. Innovative infrastructure finance is not just about ensuring sufficient revenue to increase the supply of infrastructure—it is also about keeping the demand for infrastructure in check. User fees and user pay taxation, such as road tolls, fuel taxes, and selective sales taxes on vehicles, are a superior method of funding transportation infrastructure because they collect revenue from the users of the infrastructure rather than all property taxpayers. Because the users of the infrastructure pay the tolls and the taxes, this helps keep the demand for infrastructure in check. Unless better user fee systems and user pay taxes can be brought into play, cities will always be scrambling to meet demand. The rationale for expanded taxation authority does not rest on increasing revenues only, but on building a more sustainable system of financing and funding over the long-term.

Fourth, not every tool presented here can or should be brought into play simultaneously in each and every city. At the same time, governments must resist the temptation to pick only one or two of the tools that they like best. If innovative infrastructure finance is to be successful, governments must carefully assess their infrastructure needs, scan the list of available tools, and then put into play those tools that offer the best solutions for financing, funding and delivery. This necessitates a close reading of Part II of this study. For example, if the greatest need is in new roadway infrastructure, this directs governments to road toll options and vehicle-specific selective sales taxes as well as developer cost charges. If the greatest need is in water and wastewater infrastructure, governments need to look at more accurate pricing alternatives. If the greatest need is in revitalizing neighbourhood infrastructure, then tax incremental financing is an option, as well as local improvement levies. Large anchor cities that have to provide infrastructure to a much broader region would benefit from a small local general retail sales tax. Cities and municipalities that serve as high profile tourist destinations would benefit from selective sales taxes on lodging, car rentals, and restaurants. In short, there are no silver bullets that apply across the board. What is required is a close match between the infrastructure required and the most efficient and effective tool to finance, fund, and deliver that infrastructure.

Finally, innovative infrastructure finance is heavily dependent upon governments and citizens coming to grips with a fundamental question behind infrastructure. What is the primary objective of providing infrastructure? Is the primary goal to redistribute income and ensure universal access at all costs? Or, is the main objective to provide the right amount of infrastructure at the right cost for those who use it, and to do so through the most effective and efficient means possible? If the answer to the question leans heavily toward the first option, then innovative infrastructure finance will have a hard time taking root. As long as governments and citizens see the provision of infrastructure and services as a way to equalize incomes, a centralized funding process that focuses heavily on taxation will squeeze out attempts to innovate. However, when a consensus emerges that there are better and more effective ways to redistribute income, the focus can shift toward more effective and economically efficient infrastructure provision. This is the fertile field in which innovation can germinate and flower.

The Most Promising Innovations

Throughout this study, the argument has been advanced that the characteristics of any given infrastructure asset should be the primary factor driving decisions over financing, funding and delivery. In other words, the applicability of various innovative tools is highly dependent upon the infrastructure in view. Readers should refer to Part II of the study to uncover the specific types of infrastructure best suited for each tool, and the winning conditions under which the innovative tools can be employed most effectively. A summary of the innovations that hold the most promise is provided below.

Promising Pay-As-You-Go Innovations

The earmarking of a portion of current and future property tax revenues for general capital purposes is a logical first step, being a rather simple move that increases transparency and ensures a dedicated source of pay-as-you-go financing for infrastructure that is insulated from other political priorities. Once some experience with earmarking has been established, cities should consider the earmarking of future property tax increases for specific capital purposes and projects, submitting the increases to voter approval and employing sunset clauses and tax rate caps. This draws citizens into the process of financing and funding infrastructure, and can build support for the imposition of taxes for specific purposes and projects.

Cities should also explore the full range of leasing options that are open to them. The world of municipal leasing, especially in the US, has undergone rapid development in the last 15 years. New leasing options such as cross border tax leasing and lease-purchase-financing, as well as new alternatives such as non-appropriation clauses, have made leasing a more attractive and flexible alternative. The key advantage of both earmarking and leasing is how these innovations can be employed immediately without waiting for changes in federal or provincial legislation.

Other options, such as creating strategic reserves, eliminating the education portion of the property tax, and devising a long-term policy to ensure the property tax grows alongside growth in disposable incomes are more difficult and problematic. Using reserves to fund pay-as-you-go can create intergenerational inequities, and eliminating the

education portion of the property tax is completely outside the hands of municipalities. Further, any such move would only make cities more dependent on the property tax. Devising a policy to ensure that property tax revenues kept pace with increases in disposable incomes would likely be marred by significant controversy. While each of the latter three alternatives hold promise, they are best pursued over the longer-term.

Promising Debt-Financing Innovations

As a first step, cities should put into play the five principles of smart debt (see 1.2.2.b. of Part II) by establishing a list of eligible projects for debt-financing and working through the thorny question of what constitutes an appropriate and sustainable level of debt given their local budget dynamics. Decisions on amortization terms, debt structure, and repayment policies also need to be made. Employing smart debt requires no changes in federal or provincial legislation, but it allows cities an opportunity to ensure that their borrowing policies are reasonable, balanced, and affordable. Smart debt urges municipalities to avoid the extremes of zero tolerance for tax supported debt on the one hand, and borrowing beyond their capacity on the other.

In the absence of federal and provincial action, this is where innovation with borrowing will end. But it should not. Federal and provincial governments have a role to play in encouraging municipalities to borrow for infrastructure when appropriate. As such, federal and provincial government credit enhancements, ideally offered through a national or a series of provincial infrastructure banks, would be quite beneficial. Credit enhancements should not be provided just to give municipalities a less expensive form of borrowing, but they should seek to lever other innovative infrastructure funding and delivery tools such as user fee funding, pricing innovations, and delivery through various PPP arrangements. The establishment of a national or a series of provincial vehicles for borrowing may help sustain a long-term commitment to capital borrowing and build expertise with other innovative tools.

The remaining options may offer less promise. Community bonds would certainly be beneficial in some instances, but they involve significant effort and are likely to generate only a small amount of debt-financing capital. Bond banks

essentially pool municipal borrowing, which occurs in many provinces already through provincial-municipal financing authorities. Revolving loan funds for specific types of infrastructure are not needed if an infrastructure bank can facilitate borrowings for a wide range of projects. Private and public pension plan capital is irrelevant if municipalities are reluctant to borrow, and the infrastructure that might attract such financing could be limited. Projects that can attract pension plan capital will likely do so on their own without government involvement. The experience of asset-backed borrowing is not as well established as other tools.

In the debate over innovative finance, much of the focus has been on tax-exempt bonds (TEBs), which would certainly encourage municipal borrowing and lower the costs of debt-financing. But there is considerable debate over the merits of TEBs, and there may be more effective and efficient ways of accomplishing the same goals such as direct interest rate subsidies or other federal and provincial credit enhancements. The decision to expand the bonding options open to municipalities should not be made with the sole concern of lowering borrowing costs. Rather, such a decision should be based upon their ability to lever other innovations, such as delivery through PPPs. If further research can establish a functional link between bond financing and the ability to engage other innovations, then TEBs should be revisited.

Promising Taxation Innovations

Aside from instituting a special capital levy on the general property tax (an earmarked property tax) and employing various forms of land value capture (which may be largely irrelevant if a municipality employs true market value assessment) cities can do very little in this area without changes occurring at either the federal or provincial level of government. Yet, this is the one area that holds the most promise for a more sustainable future for infrastructure. In particular, five innovations stand out:

- 1) Federal and provincial governments need to commit to a specified level of grants over the long-term, and allow municipalities to use a portion of these grants or tax shared revenues to cover the debt servicing of borrowings. The sharing of the federal fuel tax is a good example. The amount of revenue shared will eventually reach \$2.5 billion annually.

If only 30% of this amount (\$750 million) was used to fund the debt-financing of transportation infrastructure, it could lever an immediate investment of over \$10 billion, leaving \$1.75 billion annually for pay-as-you-go investments. If the full \$2.5 billion was used for debt service, it could lever \$36 billion in investments. This starts to make a serious dent in the infrastructure financing and funding challenge. But all of this is highly dependent upon a guaranteed source of future grant revenue.

2) Specialized grants should be made available that are contingent upon the use of innovative tools (e.g., PPPs and road tolling). Grants should not be contingent on specific projects (i.e., what, where and when to build should be up to cities) but on how those projects are financed, funded and delivered.

3) Cities require additional sources of taxation revenue. The rationale here is not just to increase the amount of funding to increase the supply of infrastructure, but to ensure that the provision of infrastructure is more efficient and effective, and that the demand for infrastructure is kept in check. In particular, cities need sources of user pay taxation, especially for transportation. Here, the focus should be on vehicle-specific sales and excise taxes such as a local option fuel tax, local vehicle sales taxes, parking taxes, car rental taxes, and vehicle ownership or registration taxes. If taxation is the only way to fund an infrastructure asset, the best approach is a user pay tax as opposed to a general tax, yet these are simply not in play in Canada's cities. Other forms of selective sales taxation are likely less important.

4) Cities need a source of tax revenue that keeps pace with population and local economic growth. The best taxes for this purpose are income taxes and general retail sales taxes. A small local general retail sales tax modelled around the SPLOST tax in the US would be highly beneficial, and a system of income tax revenue sharing as exists in Manitoba and most European cities should also be pursued. When cities have access to a growing stream of tax revenue they are in a better position to borrow over the long-term for the infrastructure that is needed.

5) Tax incremental financing is one of the most important tools for dealing with existing infrastructure, which is perhaps the most difficult to finance and fund. Across the US, there has been uptake of this tool in more than a few states. The

tool carries its own set of risks, but the literature generally views it as quite effective with high levels of public support. To prevent abuses, comprehensive provincial legislation outlining how and where the tool can be used should be established.

Promising User Fee Innovations

Converting infrastructure and municipal services currently dependent upon the tax base to a system of user pay is the most robust form of innovation, and should be pursued wherever possible. The candidates best suited for this innovation include municipal water treatment and distribution, wastewater collection and treatment, storm water drainage, solid waste collection and recycling, and major urban roadways, tunnels, and bridges. Whenever it is economically feasible to charge users directly, this should be followed as a matter of course, freeing up tax dollars to use for infrastructure that cannot be funded through user pay. It is important to note that technological innovations continue to push the envelope in this regard. Within the next decade, for example, it may be possible to meter individual vehicles and charge roadway users based on what they are driving and how much they are driving—a user pay system for the public road. This has the potential to usher in a new era of financing and funding for roadway infrastructure.

For infrastructure that is already funded with user fees, the emphasis should be on innovations that promote proper pricing, including full cost recovery of operations, capital, and future capital needs. Marginal cost pricing, wherever it can be employed, is preferred over average cost pricing, and fees should reflect the costs imposed by individual users. As part of this general thrust, the use of developer cost charges should not be seen as a way to fund infrastructure only, but a way to limit the demand for infrastructure. Most important here is the use of variable developer cost charges, as well as other innovations that recoup the actual costs of providing infrastructure to specific developments.

Innovations in Infrastructure Delivery

To enhance the delivery of infrastructure and services, cities should consider moving away from the traditional government department paradigm to take advantage of the many benefits that accrue from creating new utilities and corporatizing existing utilities. This allows cities to get a better handle on the

costs of providing specific services (activity-based accounting), it increases transparency, and it can inject a measure of private sector discipline in those infrastructure services.

Privatization and sale-leaseback arrangements in the municipal sector are difficult, even though they hold the potential to unleash significant sums currently locked up in physical assets. The possibilities here are limited by the potential negative reaction of the public. As such, the focus will likely have to remain on developing expertise with public-private partnerships (PPPs).

Governments in Canada must move beyond a simple hit-and-miss approach to PPPs and begin building a larger and more robust programmatic commitment. If this does not occur, PPPs will continue to operate on the margins of infrastructure development. As a first step, municipalities should explore the various PPP arrangements for operations and services, including alternative service delivery (ASD), operations and maintenance contracts (O&M contracting), and managed competition.

The UK followed this approach in the 1980s, which laid the groundwork for a more aggressive PPP program in the 1990s, which allowed governments to build the expertise necessary to push the PPP concept into the realm of infrastructure. To help in this regard, provincial and federal umbrella policies with respect to PPP may help establish the approach more firmly in the political and economic environments. This reflects the pattern followed by the heaviest users of PPP—the UK and Australia.

Other Innovations

Strategic capital asset management, maximizing existing capacities, various demand management strategies, and accounting modifications should be at the top of the list of non-financial innovations that municipalities should pursue. Getting a handle on the infrastructure challenge requires detailed information on needs that can only be developed by analyzing the assets within a larger capital asset plan. Ensuring that existing infrastructure capacities are fully utilized and following through with various demand management tools can delay the need for additional investments. Accounting modifications that pay closer attention to the state and condition of physical assets are also necessary.

5. Current State of Innovation in Canada's Large Cities

To what extent are innovative approaches to infrastructure financing, funding and delivery taking hold in Canada's large urban areas? To help answer this question, officials from Canada's 27 anchor cities—those that form the core of Canada's Census Metropolitan Areas or CMAs—were asked to complete an online survey about the usage of traditional and innovative financing, funding and delivery tools. Conducted in early 2006, 11 of the 27 anchor cities (40%) completed the survey (see Figure 5).

Traditional taxation. Not surprisingly, revenue generated from taxation is a primary source of infrastructure funding. All respondents report using a portion of their general property tax revenue (residential, commercial, and industrial) for capital purposes. Nine of the 11 cities also report using both revenue-in-lieu of taxes and local improvement levies (or special assessments). Few cities, however, report using revenue from a special business tax or a selective sales tax for capital. Only one city reports using these tax sources and only one reports using a special capital property tax levy for capital.

Typical uses of taxation revenue include roadway infrastructure, transit, policing, fire fighting, parks and recreation, cultural and community facilities, and general purpose municipal buildings. Some cities, particularly those in central and eastern Canada, report using taxation to help fund infrastructure for water treatment and distribution, sanitary sewer collection and treatment, and storm drainage.

Traditional revenue transfers. All respondents report using revenue transfers from other governments (grants and tax revenue sharing). Conditional grants are the most common type of revenue transfer, with 10 of the 11 cities using both conditional federal grants and conditional provincial grants. While few respondents report access to unconditional federal funding (most federal funds are conditional and directed at specific capital projects) 5 report receiving some unconditional provincial transfers that they direct to infrastructure. In terms of tax revenue sharing, federal and provincial fuel taxes are the most common shared tax. While several cities report receiving revenue from other provincial tax and revenue sources, this was the exception rather than the rule. Some cities report

receiving capital funding from larger regional governments. For example, Vancouver received some funds from TransLink (the Greater Vancouver Regional District's transit authority) for road network maintenance and upgrading.

Urban street renewal is the most common infrastructure funded by revenue transfers—9 out of 11 cities cite roads and bridges as prime areas funded by transfers. Other infrastructure funded by grants includes cultural and community facilities, recreation facilities, and general municipal buildings. About half of the cities report using revenue transfers for their water and wastewater systems, but relatively few use them for storm drainage or solid waste collection.

Traditional user fees. All respondents employ a package of user fees to help fund specific municipal infrastructure. The most commonly cited user fee is developer cost charges (DCCs). Eight of the 11 cities impose DCCs for new infrastructure to accommodate growth, and the same number report that developers often build local infrastructure and later turn it over to the city (donated assets). Cities in Quebec report that they do not have the power to impose DCCs. Seven cities also report using a variety of frontage charges for certain infrastructure, and another 6 say they impose specific user fees on certain services to recoup capital costs.

DCCs are specifically intended to fund infrastructure related to growth. Cities report using DCCs for new local, collector, and some arterial roadways; streetlighting; sidewalks; landscaped open space, parkland acquisition, park development, playgrounds, and trail development; fire facilities; and water, sewer, and storm drainage extension. Some cities report a more comprehensive set of infrastructure covered by DCCs. In Vancouver, for example, DCCs have helped fund affordable housing, childcare facilities, libraries, and recreation centres.

Other fees for infrastructure include frontage fees for local water and sewer improvements. In Winnipeg, frontage fees are used to make local road and sidewalk improvements, as well as improved back alley access. User fees are also used for the capital needs of water and sewer. In St. John's, a set of increased user fees is funding new water and wastewater treatment plants, and in Regina, fees are being used to fund waste collection and the landfill.

Traditional borrowing. All respondents report using borrowing to help finance the up-front costs of infrastructure. Five of the cities borrow by issuing their own debentures and five borrow through provincial agencies. Three of the cities borrow from banks and other financial institutions, and 3 say that they negotiate borrowing arrangements with developers and other private sources. Some cities report borrowing against their own reserve funds, and cities within a larger regional municipality report borrowing through the region. For example, St. Catharines borrows through the Regional Municipality of Niagara, and Oshawa borrows through the Regional Municipality of Durham.

Some cities outline a set of principles they follow when borrowing. For example, some cities only use borrowing for new projects that are very large, or for major retrofits of existing infrastructure. Funding for recurring capital expenditure, like routine maintenance, is rarely borrowed. Other cities say that they restrict borrowing to cost-shared projects or to infrastructure that has its own dedicated revenue stream, such as user fees.

Water and wastewater assets are the most common kind of infrastructure financed by borrowing, followed by major roadways and bridges, as well as a variety of municipal buildings and facilities. Examples here include police and fire stations, libraries, recreation facilities, parking garages, seniors' lodges, social service buildings, and city halls. Only one city explicitly mentioned borrowing for transit or park development. Other infrastructure financed by borrowing includes streetlighting and storm drainage infrastructure.

Other traditional sources. Ten of the 11 cities that completed the survey report using other financing and funding sources. Ten cities report that they have either sold an asset or shed a municipal service and used the proceeds for capital. Eight of the cities say that they regularly use savings accumulated in reserve funds, and 6 say that they commit the operating budget surplus of the prior year to current year capital expenditures. The disposition of assets and services is not typical or ongoing, but it does occur from time to time. For example, Vancouver sold an existing site of land to finance a new replacement facility elsewhere in the city, and Winnipeg sold off municipally-owned land that was tagged for roadways. In 2001, Winnipeg sold Winnipeg Hydro to Manitoba Hydro, but those funds were not specifically

FIGURE 5: Results of the Canada West Foundation Survey

TRADITIONAL MUNICIPAL TAXATION		11/11 Cities	
General Property Tax	11 cities		
Revenue-in-Lieu of Property Tax	9 cities		
Local Improvement Levies	9 cities		
Special Property-based Business Tax	1 city		
Local Selective Sales Taxes	1 city		
Other Taxes	1 city		
TRADITIONAL REVENUE TRANSFERS		11/11 Cities	
Federal Conditional Grants	10 cities		
Provincial Conditional Grants	10 cities		
Federal Unconditional Grants	2 cities		
Provincial Unconditional Grants	5 cities		
Federal/Provincial Fuel Tax Revenue-sharing	9 cities		
Other Tax Revenue-sharing	2 cities		
TRADITIONAL USER FEES		11/11 Cities	
Developer Cost Charges (DCCs)	8 cities		
Donated Assets	8 cities		
Frontage Charges and Fees	7 cities		
Specific Capital Cost Charges and Fees	6 cities		
Other User Fees	2 cities		
TRADITIONAL BORROWING		11/11 Cities	
Debentures Issued by the City	5 cities		
Borrowing via Provincial Agency	5 cities		
Bank borrowing	3 cities		
Negotiated Borrowing	3 cities		
Other Borrowing	4 cities		
OTHER SOURCES OF TRADITIONAL CAPITAL REVENUE		10/11 Cities	
Sale of Assets/Municipal Operations	10 cities		
Reserves	8 cities		
Previous Budget Surpluses	6 cities		
All Other	0 cities		
INNOVATING WITH TAX SOURCES		9/11 Cities	
Earmarking Property Taxes for Capital	9 cities		
Securing New Local Taxes	3 cities		
Reduced Education Property Taxes	3 cities		
Tax Increment Financing	3 cities		
Value Capture Taxation	2 cities		
Directed Taxation	1 city		
Other Tax Innovations	1 city		
Land Value Tax (Split-Rate)	0 cities		
Blight Taxes	0 cities		
INNOVATING WITH REVENUE TRANSFERS		3/11 Cities	
Guarantees for Future Levels of Transfers	3 cities		
Receiving More Unconditional Transfers	1 city		
Using Transfers to Service Debt	1 city		
Changes to Cost-Sharing	0 cities		
Other Innovations	0 cities		
INNOVATING WITH USER FEES		11/11 Cities	
Converting Tax Services to User Pay	9 cities		
Marginal Cost Pricing	4 cities		
Variable DCCs (on-site)	5 cities		
Front-ended DCCs (on-site)	2 cities		
Off-Site DCCs	2 cities		
Road Tolling	0 cities		
Congestion Road Pricing	0 cities		
Other Innovations	1 city		
INNOVATING WITH BORROWING		9/11 Cities	
Implementing a New Debt Strategy	8 cities		
Using Subsidized Borrowing	3 cities		
Issuing Community Bonds	2 cities		
Issuing General Obligation Bonds	2 cities		
Lease-back Financing	2 cities		
Other Borrowing Strategies	1 city		
Using Provincial Ratings as a Proxy	0 cities		
Borrowing From Pension Funds	0 cities		
Borrowing From a Provincial Revolving Fund	0 cities		
Tax-Exempt Bonds	0 cities		
Revenue Bonds	0 cities		
Lease-Purchase Bonds	0 cities		
Providing Loan Guarantees	0 cities		
INNOVATING WITH NON-PUBLIC DELIVERY		10/11 Cities	
General Public Private Partnerships	8 cities		
Contracting Out and/or Privatization	6 cities		
Managed Competition	5 cities		
Alternative Service Delivery	4 cities		
Private Finance Initiatives	4 cities		
Special Purpose Vehicles	0 cities		
Other PPP Strategies	1 city		
SOFT INFRASTRUCTURE FINANCE AND FUNDING OPTIONS		5/11 Cities	
Strategic Asset Management	3 cities		
Regionalization of Delivery	3 cities		
Rationalizing/Maximizing Existing Capacity	3 cities		
Creating Special Financing Districts	2 cities		
Demand Management	0 cities		

dedicated to infrastructure. Abbotsford reported that any cash from the disposition or divestiture of assets is counted as revenue to its capital reserves.

Among the more common types of infrastructure funded by these sources are land acquisition and facility construction, roads, bridges, transit, building repairs and upgrades, information technology upgrades and improvements, and parks and recreation facilities. Some cities state that most of their equipment replacement and asset maintenance is funded through a system of capital reserves, where funds are saved today in anticipation of future expenditures tomorrow.

Innovative taxation. Four cities report some level of innovation with municipal taxation. The most popular innovation is simply earmarking a portion of the general residential, commercial, and industrial property tax for various infrastructure expenditures. Nine of the 11 cities report that they engage in some form of earmarking, either for capital expenditures on a pay-as-you-go basis or for the repayment of debt borrowed to finance infrastructure. For the most part, this is where broad-based innovation tends both to start and stop. Few cities report having secured any new local taxing authority or a reduction in the education portion of the municipal tax. A few cities have attempted some projects with tax incremental financing, but this has yet to work itself out, particularly with respect to provincial approval. Only 2 cities use a form of value capture taxation. Other innovations, such as directed taxation, blight taxes, development taxes, and land value taxes or split-rate taxation, are relatively unknown.

In most of the cities, earmarked property taxes are used to fund a variety of infrastructure—airport development roads, bridges, back lanes, transit, wastewater infrastructure, parks, recreation facilities and other municipal buildings, rolling stock and other equipment, and information technology upgrades. Abbotsford, for example, regularly finances the repayment of infrastructure debt through the earmarking of property tax. Vancouver separates the debt-financing component of the property tax from all other supported costs.

Saskatoon is currently contemplating the dedication of new assessment growth to fund specific inner city projects, such as a special bus to transport downtown residents to services

not currently available in their neighbourhood. Saskatoon also attempted a tax incremental financing project, but was unsuccessful in convincing the provincial government to dedicate a portion of the future education component of the tax, which made the project unworkable. Saskatoon is currently working on a project that would see infrastructure required for a new development being funded from the increase in property taxes produced by that development. Winnipeg notes that many of the tax innovations in the survey were brought forward in that city's New Deal initiative. However, none of them were implemented.

Innovative revenue transfers. Only 3 of the 11 cities report innovation with respect to the current system of revenue transfers. Saskatoon reports using federal fuel tax revenue as a long-term funding source for debt repayment—the only respondent to report this innovation. Saskatoon is also attempting to negotiate a longer-term agreement with the province for future unconditional grants, but has not been successful to date.

Innovative user fees. All respondents report innovating to some extent with their current basket of user fees. The most commonly mentioned innovation—and one of the most innovative of all approaches—is user pay conversion. Nine of the 11 cities report that they had moved a tax-based infrastructure to a user fee-based operation. Four cities report that they are considering marginal cost pricing for some services, or that they have implemented peak period pricing. Five cities report that they use variable developer cost charges, and another 2 are doing some front-ending of these charges as well. Two cities say that they use off-site developer cost charges.

With respect to user pay conversion, the most popular areas seem to be in solid waste services and storm drainage. Both Saskatoon and Edmonton recently created new storm drainage utilities, and the City of Regina recently created a new solid waste utility. But other services have been converted as well. For example, the City of Winnipeg recently turned over all the municipal parking lots and spaces to a new municipal parking authority, which must implement a program of full cost recovery. None of this, however, has been applied to a critical need: roads. No cities in the survey reported the usage of road tolls.

Specific examples of marginal cost pricing were not provided. However, Saskatoon notes that its electrical utility applies a higher rate during peak consumption periods, and additional surcharges for wastewater collection and treatment come into play under certain circumstances. Variable, front-ended, and off-site developer cost charges speak to the infrastructure needed to accommodate growth. The kinds of infrastructure funded by these innovations are similar to that provided through the more traditional developer cost charges.

Innovative borrowing. Nine of the 11 cities report some level of innovation with respect to borrowing, but it is generally limited to working through a new debt management policy and taking advantage of lower cost borrowing through subsidized interest rates. Eight cities report that they have recently revamped their municipal debt policy to help fund infrastructure, and another 3 report that they are taking on debt that is subsidized to some extent. However, a range of other tools such as community bonds and lease-purchase bonds remain virtually unknown.

Renewed borrowing policies are being used to finance a broad range of infrastructure assets, from roads and recreation facilities to municipal parking facilities and water and wastewater infrastructure. Saskatoon recently renewed its debt financing policy in three ways. First, a strategy was developed to finance certain infrastructure with debt, and then use committed future federal fuel tax revenue to fund the borrowings. Second, borrowings for future cultural and recreational facilities will be funded by assessment growth. Third, Saskatoon is using lower interest borrowings through FCM's Green Fund to finance improvements in the wastewater treatment facility, which will be repaid through phased-in increases in its water and wastewater rates. St. John's is also pursuing this option for its wastewater treatment plant.

Innovative delivery. The survey also asked the cities to comment on their use of innovative infrastructure delivery, such as the use of public-private partnerships (PPPs). Nine of the cities report the use of PPPs. For example, Winnipeg used a PPP to fund the Charleswood Bridge and Abbotsford may use a PPP for a new sports arena complex that would include a library, fire hall, seniors' centre and commercial and residential units. Windsor used a PPP to finance an office tower and Oshawa used one for a recreational facility. Saskatoon, in conjunction with the federal government, the

province, two school boards and the Saskatoon Tribal Council, used a PPP to fund the White Buffalo Lodge—an inner city recreational and health facility for Aboriginal youth.

In a similar vein, 6 respondents report contracting out to the private sector in order to get infrastructure built and maintained. This includes contracting out services such as park mowing and access transit for the disabled in Saskatoon, refuse collection, winter maintenance and recreation facilities in Oshawa, and handi-transit services in Windsor.

Soft infrastructure options. The survey also asked cities to comment on non-financial strategies to deal with their infrastructure challenges. These options are designed to manage the demand for infrastructure as opposed to finding new ways to finance, fund or deliver an increase in the supply. Less than half of the cities report using these strategies. For example, only 3 cities have implemented a strategic asset management program, are regionalizing delivery or seeking to maximize usage of existing capacity. No city reports that they are focusing on strategies for demand management.

Accounting practices. Finally, the survey asked cities about their accounting systems. As noted earlier, cities that use a system of cash-based accounting will typically expense the full value of all capital expenditures made in the year. Some have argued that this form of accounting has led cities to restrict their levels of capital investment so as to avoid a highly visible budget deficit. Accrual accounting allows the costs of capital assets to be written off over a period of time, and also allows governments to better track and record the consumption of their capital assets. The survey reveals that 8 of the 11 cities currently employ cash-based accounting, and thus, fully expense all of their capital expenditures in the year they are made. Only three cities employ an aspect of accrual accounting.

Cities were asked whether they engage in activity-based accounting. This type of accounting tracks revenues and expenditures for specific services that the city provides. For example, under activity-based accounting, a city would track all the revenues collected from transit operations, as well as the expenditures of operating the service, and repeat this across the full spectrum of municipal operations. This allows cities to understand better the revenue potential and expenditure needs of each service they offer, and also smooths

the way for involving private or nonprofit involvement since there are data on the opportunities and the costs of providing any given service. Of the cities surveyed, 2 report engaging in no activity-based accounting at all, while 6 do so on a partial basis only. Services for which activity-based accounting are carried out are those funded by user fees. Cities report that the number one issue in activity-based accounting is the challenge of appropriately assigning overhead costs.

The survey results, combined with the review of secondary documents and accounts, suggest that there is significant room for more innovation in the financing, funding and delivery of infrastructure in Canada's large urban areas. Compared to the range of tools in use in other parts of the world, Canadian cities exhibit relatively little innovation in this critical area of public policy.

This begs the question of why this is the case. Part of the explanation lies in a lack of awareness of the expanded toolkit. This report, especially Part II's detailed discussion of the range of available tools, will help rectify this situation, but it is up to decision-makers at the local, provincial and federal level to familiarize themselves with the options that are out there and accept the risks associated with trying new things.

A second reason for the lack of uptake is the fact that the infrastructure debt faced by Canada's large cities has only recently come to the fore. For years, Canada's large urban areas have been able to get by with traditional tools, but population and physical growth, aging assets, and increased competition for scarce public dollars have created conditions ripe for greater experimentation. At the same time, the reluctance of cities to take on debt has unnecessarily reduced the range of tools available to them.

The nature of Canadian federalism may be another factor inhibiting uptake of new tools. Cities in Canada operate within relatively narrow parameters rooted in a system developed long before the rise of the modern metropolis that is now the norm in Canada and home to the majority of the population. Cities simply do not have the powers they need to use the full range of tools. Hence, there is the usual need for the various levels of government to work together to enable cities to innovate.

As the lack of experience with innovative tools such as public-private partnerships is replaced by a growing set of Canadian examples, the use of innovative options is likely to increase.

The survey shows that cities finance their infrastructure in a variety of ways, but are generally limited to property taxes, provincial and federal revenue transfers, user fees, and some borrowing. Five conclusions emerge from the results:

1) There has been very little innovation in terms of tax sources. Aside from the earmarking of property taxes for infrastructure and debt repayment, cities are still heavily dependent upon the property tax.

2) Cities report very little innovation in the area of revenue transfers, aside from the recent move to share the federal fuel tax and some increased provincial tax, both of which are positive steps in the right direction. Saskatoon is somewhat unique in this regard given its decision to use some of its shared fuel tax revenue to repay debt used for infrastructure. This is broadly reflective of the GANs/FRANs/GARVEE process in the US (see Part II for more information on these American tools).

3) A number of cities report that they are actively seeking to move certain infrastructure off the tax base and convert it to user pay. However, no city reported applying this innovation to roadway infrastructure, which is a clear need in most Canadian cities.

4) While Canadian cities have not innovated much with specific debt tools such as bonds or lease-purchase bonds, many have revamped their debt policies. This may signal an increased willingness to finance infrastructure with borrowing. Given the reluctance of many cities to borrow over the last 20 years, this is a positive sign, since debt has a key role to play in the financing of infrastructure.

5) It appears that many cities are willing to consider public-private partnerships as a means of delivering infrastructure. Three-quarters of the cities that responded to the survey indicate that they have participated in a PPP. As experience with the PPP process accumulates, cities may begin recording even more successes with this innovation, opening an entirely new avenue for infrastructure financing and funding.

In the end, however, there are still a number of approaches that remain relatively untried in Canada. Greater uptake of these ideas will help ease the frustrations that cities are experiencing when it comes to infrastructure finance.

6. Innovative Urban Infrastructure Finance and Federal and Provincial Governments

The municipal governments that oversee Canada's large urban areas are the first line of response to the infrastructure needs of these regions. However, as a federal country, provincial governments and the national government also have critical roles to play. What are the implications of an expanded toolkit of urban infrastructure financing, funding and delivery for the provinces and Ottawa? This section provides a preliminary answer to this question.

In Canada, municipalities are under the authority of provincial governments. While this limits the scope of federal action, the issue of urban infrastructure has also become a matter of growing national importance. As such, the federal government has taken a number of steps to help address the challenge. Between 1994 and 2003, the federal government spearheaded a number of tripartite infrastructure funding programs totalling some \$13.4 billion (Vander Ploeg 2004a). The recent federal fuel tax sharing agreement will eventually provide an additional \$2.5 billion annually when it hits full stride. Current federal initiatives include the renewal of infrastructure funding programs in the most recent federal budget and the federal government's willingness to discuss the fiscal imbalance.

As the federal government continues to refine its involvement in urban infrastructure, perhaps the best way forward lies in the notion of a tripartite effort involving Ottawa, the provinces, and Canada's big cities. With this in mind, how does innovative infrastructure finance relate to the federal government and the provinces and what actions might they consider pursuing?

Use of federal and provincial grants to encourage innovation in infrastructure finance, funding and delivery. One of the most notable innovations in the US is how the federal government has made available a set of grants specifically predicated upon the recipient engaging in innovative infrastructure financing, funding or delivery. To the degree that various

innovations are a worthwhile goal, the federal government and the provinces can encourage better uptake by using grants as the lever. Grants should also be used to encourage better accounting practices and the correct pricing of municipal infrastructure and services. They should not, however, be used to tell local governments what to build, when to build, or where to build as these decisions are best made at the local level. Grants, moreover, will remain key sources of revenue until they are replaced by expanded tax revenue sharing or increased taxation powers. Indeed, the transition to a new and improved system should be a core element of the ongoing discussion of fiscal imbalance in Canada. In the meantime, grants can be used to encourage innovation.

Facilitate more in-depth research on innovative infrastructure finance, and most importantly, ensure that this knowledge is effectively transferred. Part II of this report provides a detailed taxonomy of the tools local governments around the globe use to finance, fund and deliver urban infrastructure. At the same time, each tool should be explored more fully, particularly with respect to the development of appropriate case studies and the establishment of best practices. This research then needs to be transferred to those public and private actors who will ultimately be charged with carrying it out on the streets of our cities. Provincial and local governments may not have the capacity to conduct such an effort, leaving a vacuum that can be filled by federal action.

Initiate specific pilot programs that test various innovative finance approaches. In most jurisdictions, experimentation with innovative finance developed on the heels of successful pilot programs that saw partial implementation of an idea over a period of time, within a controlled environment, and in specific locations. For example, PPPs did not suddenly appear in the UK, but were part of a natural evolution with service contracting more generally speaking. In the US, state infrastructure banks and value pricing were all test-driven in various pilot programs and demonstration projects that were closely monitored and evaluated. If the results proved positive, the idea was unleashed and allowed to take root.

Devise a national initiative on public-private partnerships, in conjunction with the provinces and municipalities, to guide development of a market for PPP and to facilitate proper usage. Substantial public-private partnering will not occur if the

policy environment is marked by a piecemeal approach that lacks consistency and a strong commitment from the public sector. PPPs will only emerge as a significant actor when there is a sustained and long-term commitment that is both intentional and programmatic in nature. Provincial policies on public-private partnerships need to be encouraged, and a working register of infrastructure projects developed. The federal government can facilitate this process. In Australia, each state has developed its own specific policy with respect to PPPs, but the combined effect appears to be a strengthened commitment right across the country.

Create a national infrastructure bank with branches in each province such that administrative details are decided upon provincially with local input. Over the last 20 years, local governments have become very reluctant to debt-finance their infrastructure, despite attractive rates of interest. When debt-financing is ruled out as a financing mechanism, infrastructure invariably suffers since pay-as-you-go does not provide sufficient up-front capital. Local governments need to be encouraged to borrow where appropriate. A federally sponsored infrastructure bank may be one means to advance this goal. Various credit enhancements can lever additional innovation.

Federal and provincial support should be consistent, predictable, reliable, and long-term. The current level of intergovernmental transfers, if sustained over the long-term and made more predictable, could be used to fund a significant amount of debt-financing for infrastructure, going well beyond what can be provided on a pay-as-you-go basis. However, local governments will not use transferred revenue to fund borrowings if the revenues cannot be guaranteed over a longer time horizon. If the national infrastructure challenge is as serious as many suspect, then a long-term commitment for federal and provincial support should be put in place.

Solving the lack of buoyancy in local government tax sources would allow for better financing of infrastructure. Governments that have a diverse set of tax tools at their disposal that directly link to economic growth are in a much better position to debt-finance infrastructure. When tax revenues grow slowly, very little debt can be taken on without burdening the operating budget. A stronger commitment to taxes based on more elastic tax sources would help address this problem. The Manitoba model is a progressive example, where the

province shares a portion of personal and corporate income taxes with municipalities. The most efficient and accountable option is an expansion of local taxing authority. This is outside the hands of the federal government, but Ottawa could share various tax revenues with the provinces, which then pass the revenues on to municipalities. Municipalities would then have to answer to local taxpayers for the revenue they raise for infrastructure projects.

Provinces can rethink their interest in local government affairs and the means by which it is carried out. The provincial interest needs to shift from the traditional concern of preventing local governments from making mistakes. The primary provincial interest now lies in ensuring that cities can continue to drive economic growth and increase living standards. The fact of provincial control is not the issue. The problem is the detailed method of control that precludes certain actions, fosters inertia and stifles initiative. Provinces need to restrain the urge to move in and correct every alleged municipal problem. Rather, provinces can establish a system of general controls that addresses the critical need to maintain a healthy municipal sector while avoiding detailed regulations. Whether it is called natural person powers, city charters or home rule, many countries are now seeing the advantages of placing cities at a half-way point between full constitutional recognition and their current status quo position.

7. Conclusion

The need for new approaches to financing, funding and delivering urban infrastructure is increasingly evident. Like most western democracies, Canada faces a significant infrastructure debt, but while Canada has been slow to embrace change, other countries are demonstrating decidedly greater leadership and innovation in how they choose to address infrastructure gaps. Canada's competitors are investing heavily in infrastructure, and demonstrating a high level of creativity as they do so by using tools that Canadians have perhaps heard about, but not aggressively pursued. While Canadians continue to debate the merits of installing water meters, our competitors are thinking about how new technology can be used to meter their cars. The world is changing quickly.

Canada has not been completely idle in terms of innovation; the recent federal-provincial-municipal fuel tax sharing

agreement is one example of recent efforts to think creatively about infrastructure finance. Nonetheless, efforts to date have been insufficient in meeting the challenges cities face.

If a huge infrastructure funding gap is the bad news, then the good news is the sheer number of the policy choices open to meet that gap head on. Canada's choices are not limited to hiking property taxes, slashing programs, and holding back on capital investment. There is a wide range of policy alternatives that point in other directions. What is needed is a concerted effort by all three orders of government to show leadership and a degree of boldness in pursuing new alternatives.

Some of these ideas are not entirely new to Canadians. Others are quite foreign and will likely elicit strong reactions—both positive and negative. None of the innovative options put forward in this report will find unanimous support. Mistakes will be made—some tools will work, some will not. But one thing is clear: each time an option is deemed undesirable, the available choices in the buffet narrow. Canadians and their governments need to make at least some new ideas work in a Canadian context. If we cannot find the collective gumption, then the status quo is all that we have left. That might be comforting for some, but the status quo is what created the infrastructure challenge in the first place. Sticking with the status quo will only lead to greater problems down the road.

It must be remembered that an expanded set of tools does not let taxpayers and the users of infrastructure off the hook. If infrastructure is needed, taxpayers and users will have to foot the bill. Innovation may save money and demand management may reduce costs, but the money for more and better infrastructure still has to come from somewhere. Innovation is not a silver bullet, and tradeoffs between disposable income, other government services, and the level of infrastructure available will have to be made.

A politically-charged issue raised by innovative infrastructure finance is the need to revamp the fiscal powers of cities and the nature of their relationship with provinces and the federal government. Many of the innovative tools available are non-starters without significant changes to the powers of cities to raise revenue. Hence, as Ottawa and the provinces sit down to figure out their fiscal relationship, the outdated system that hems in cities should also be rethought.

There are many innovative ways to finance, fund and deliver infrastructure and most of these are relatively straightforward. They need to be applied to the unique circumstances of Canadian cities, but they are not in themselves particularly challenging elements of public policy. It is, rather, the political context that is the most difficult barrier. If there is a will, a way can be found. [CWF](#)

END OF PART I

PART II: Detailed Taxonomy of Urban Infrastructure Finance, Funding and Delivery

1. Finance Tools

1.1. Pay-As-You-Go

Revenues from reserves and reserve funds have increased in importance in most cities. ... A major reason for increasing reliance on reserves and reserve funds may be attributed to the expanding use of development charges and a greater emphasis on pay-as-you-go financing for capital projects. ... Long-term borrowing over the past twelve years has displayed an undulating pattern as a source of financing in most cities and regions, but overall, it has declined in importance as a source of financing capital projects.

—Harry Kitchen (2003)

With a pay-as-you-go financing approach, governments purchase or construct only those capital assets made possible by financial resources currently at their disposal, whether that be cash in the capital budget, savings in reserves and reserve funds, or other cash on hand. Pay-as-you-go financing essentially takes current revenues—taxes, user fees, and grants collected in the current fiscal year—and applies them directly to current capital expenditures for the same year. Savings gathered over time are also used as a source of funds. Most cities have drastically reduced their stock of debt since the mid-1980s and have been reluctant to issue new debt, particularly tax supported debt. Thus, the pay-as-you-go approach is most likely the dominant form of infrastructure financing for municipalities in Canada.

Advantages

Proponents of pay-as-you-go advance two broad supporting arguments. First, pay-as-you-go is the least expensive option since it avoids costs associated with interest on debt. Thus, pay-as-you-go is presented as the most fiscally responsible approach to infrastructure, as governments spend only what they can currently afford. In the absence of debt, the threat of higher taxes down the road is minimized; taxes have not been deferred to tomorrow by borrowing undertaken today.

Second, pay-as-you-go maintains fiscal flexibility. It keeps bond ratings intact and preserves borrowing capacity. Borrowing today means that a stream of revenues must be dedicated in the future to repay debt rather than being available for other purposes. Interest and principal repayments on debt always have first draw on fiscal resources. In the absence of debt, future revenues are free and clear.

Both arguments have considerable merit with respect to federal and provincial governments, but less traction when considering local governments. As a portion of their annual expenditures, Ottawa and the provinces spend relatively little on infrastructure. As a result, they can more easily smooth out capital spending through the judicious timing of specific projects and the pay-as-you-go approach (Elton and Vander Ploeg 1994). Municipal budgets, however, are very different. They are capital intensive. Some projects, such as water treatment plants, are so expensive that the up-front costs exceed the amount of tax revenue collected in any one year. The only way to pay-as-you-go in this instance is to start saving now and wait to invest 20 or 30 years out.

Disadvantages

The advantages of the pay-as-you-go approach do not always apply. Because pay-as-you-go limits infrastructure investment to cash on hand, it cannot provide enough money for large, expensive investments. While pay-as-you-go avoids the interest costs associated with debt, the subsequent waiting period means that a good portion of the envisioned interest savings will be offset by inflation. For example, if a roadway is needed today but it must wait 20 years until enough funds have been gathered, that roadway will ultimately be more expensive. The costs of interest have been avoided with pay-as-you-go, but the higher up-front cost that arises from waiting means little may be saved in the end.

Proponents of pay-as-you-go will counter that future inflation itself can be offset with the interest income earned by the savings that are being built up over time, and since interest

income earned on savings and interest paid on debt are typically higher than the inflation rate, the net savings are still positive under the pay-as-you-go approach. This boils down to the differential between the effective interest rate on both savings and debt, the current and anticipated rate of inflation, and the potential for the capital project in question to generate additional tax and user fee revenues that can offset the costs of interest. Since interest rates are typically higher than the inflation rate, one may indeed save by waiting. However, delaying a major infrastructure project can entail foregone economic benefits and increased tax revenues.

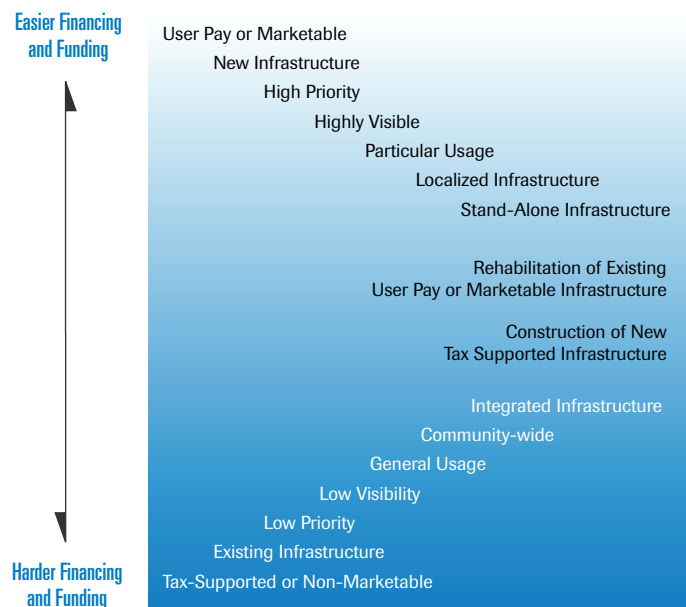
The matter of flexibility is not straightforward either. Under both pay-as-you-go and borrowing, funds are effectively de-commissioned for alternative uses. It matters little whether future funds are dedicated to pay interest and principal on debt or whether they are dedicated to a strategic capital reserve for a future project. In either event, the funds are unavailable. The only way flexibility under pay-as-you-go can be achieved is if the plug is pulled on a planned infrastructure project. Assuming that a given project will eventually proceed, there is little inherent flexibility gained by the pay-as-you-go approach.

A lack of intergenerational equity is perhaps the biggest concern. If pay-as-you-go is employed for assets with a long life span, the current generation of users fronts all the costs and effectively subsidizes future generations who pay nothing yet still enjoy the benefits. This complaint is reflective of the fiscal deficit and debt debates of the early 1990s, when the current generation of Canadians borrowed heavily to consume government services (as opposed to investing in capital) and then left the bill for future generations.

Winning Conditions and Applications

Pay-as-you-go requires large up-front capital outlays, it competes with other expenditures for scarce general fund revenues, it imposes the full costs on current taxpayers instead of all beneficiaries, and it delays major projects. However, none of this is to say that pay-as-you-go has no role to play. The point is that pay-as-you-go should not be the result of an unyielding ideological bias against debt. Rather, pay-as-you-go should be applied only to infrastructure where it is appropriate. Employing pay-as-you-go for all assets is unduly conservative, leaving infrastructure to compete for limited property tax dollars against police protection or fire

FIGURE 6: Reserving Pay-As-You-Go Financing

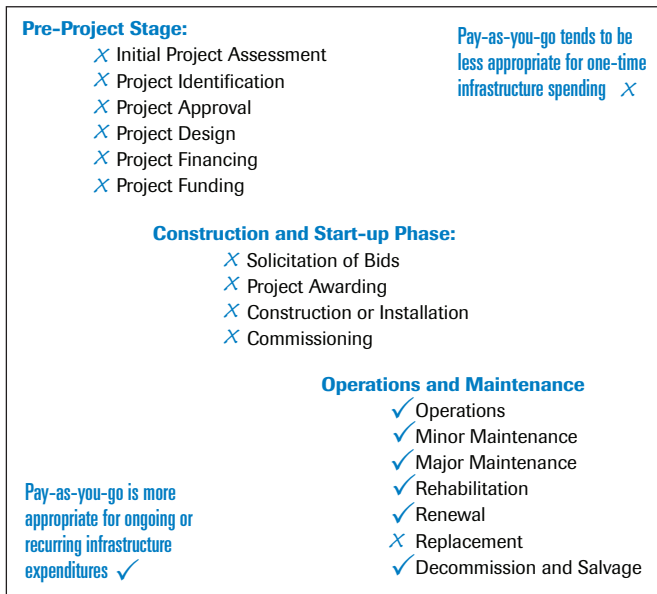


response. This is a competition that infrastructure has proven it cannot easily win.

Because of its advantages and disadvantages, pay-as-you-go should be reserved for assets where the benefits accrue primarily to current users. As such, pay-as-you-go is most appropriate for infrastructure with a short life span and a short payback period. It is best suited for smaller assets with low up-front costs that can be easily covered by current revenue, and where the assets can be quickly completed or commissioned. Pay-as-you-go is also suited for technological infrastructure that runs a high risk of becoming obsolete within a relatively short time frame. Examples of such assets include the municipal vehicle fleet, communications and IT, and other specialized equipment.

In general, the pay-as-you-go approach is best reserved for the more difficult types of infrastructure to finance and fund. Figure 6 sets a number of infrastructure characteristics on a spectrum. The easiest type of infrastructure to finance and fund is an entirely new asset that has a high priority, is highly visible, and can employ user fees. Conversely, rehabilitating a non-marketable or tax supported existing asset that has a lower public priority and lower visibility, is much harder to accomplish. Because of the scarcity of pay-as-you-go dollars, they should be kept for the more difficult financing challenges. This reserves debt-financing for other infrastructure assets

FIGURE 7: Types of Infrastructure Spending



that may have higher priority, higher visibility, and thus, more public support.

Pay-as-you-go should not be pursued for infrastructure that is marketable. In this case, self-financing debt funded through user fees is more appropriate. This reserves scarce pay-as-you-go funds for projects that would otherwise have to be financed through tax supported debt, which can be difficult if public support is lacking.

When it comes to pay-as-you-go financing, the type of infrastructure spending anticipated can be just as important as the particular characteristics possessed by the infrastructure asset on which spending will occur. Figure 7 highlights some of the many types of infrastructure spending that occur across the life-cycle of a typical infrastructure asset. In general, pay-as-you-go is the most appropriate for recurring and ongoing infrastructure spending. This includes all costs related to operation of infrastructure, as well as programs for the preservation of assets in terms of minor and major maintenance. Pay-as-you-go transfers from operating to capital are preferred for ongoing annual expenditures that are stable and will increase slowly over time. Examples of recurrent expenditures include such things as the continual maintenance, repair, or upgrading of sidewalks, roads, streetlights, and parks. Pay-as-you-go should generally be avoided for non-recurrent infrastructure such as the construction of buildings, libraries, museums, and other large fixed assets.

1.1.1. Traditional Pay-As-You-Go

Municipalities in Canada employ six tools for pay-as-you-go financing. Because the first four tools (A-D) double as mechanisms for funding, the discussion for these tools has been limited to how well each fits with pay-as-you-go financing. The advantages and disadvantages, winning conditions, and applications of these tools are more fully discussed in section 2.1.1.

A. TRANSFERS TO CAPITAL FROM CURRENT REVENUE

The largest source of municipal own-source revenue for pay-as-you-go is a transfer of current revenue from the operating budget to the capital budget. Revenues that are often transferred include a portion of the general residential and commercial property tax, special business property taxes, selective sales tax revenues, user fees, and other general purpose revenue such as licenses and permits, fines, and interest income. While different cities transfer a slightly different mix of revenues, general residential and commercial property taxes constitute the single largest source transferred. User fees, for example, tend to attach to specific services leaving little to transfer. Other own source revenues, such as selective sales tax revenues, are quite small as a proportion of most local government budgets.

Since municipalities are not allowed to run deficits on their operating budgets, most record an excess of revenues over expenditures—a surplus—at the end of the fiscal year. These surpluses often run into the millions of dollars, and some municipalities have passed standing policies that direct all operating surpluses to the following fiscal year’s capital budget or to various capital reserves. Such standing policies help increase the amount of available pay-as-you-go financing, but it really amounts to nothing more than an indirect transfer of property taxes rather than a direct transfer. Further, surpluses are variable and relatively inconsistent as a financing source. Surpluses in one year can easily disappear by simply ramping up operating expenditures in the following year.

In some ways, property taxes tend to work well as a pay-as-you-go tool. Property taxes have an immobile and stable tax base, which produces predictable revenues. Since pay-as-you-go financing should be reserved for ongoing expenditures that are stable and increase slowly over time,

the property tax would seem to provide a relatively good fit. At the same time, the property tax is also a relatively narrow and inelastic tax that links to only one aspect of the broader economy—the current value of real estate. As such, the property tax is not a vibrant, dynamic, or growing source of pay-as-you-go dollars.

B. LOCAL IMPROVEMENT LEVIES AND SPECIAL ASSESSMENTS

Local improvement levies are a second source of pay-as-you-go capital financing. While they take a number of forms, they generally refer to a special property tax collected directly from property owners who stand to benefit directly from an improved or enhanced infrastructure asset in a localized area of a particular community. Local improvement levies come under a wide assortment of names, including property tax surcharges, special assessments, and benefit assessments. Sometimes they are levied within formalized local improvement districts, community improvement districts, special improvement districts, business improvement districts, and road improvement districts.

Local improvement levies are very restricted as a source of pay-as-you-go financing. Since they apply only to a limited number of property owners in a specific geographic area, local improvement levies can only finance pay-as-you-go projects that are relatively small and possess low up-front costs. As such, local improvement levies are usually used to fund borrowings undertaken to improve various infrastructure systems as opposed to pay-as-you-go (Atlanta Regional Commission 2003).

C. INTERGOVERNMENTAL GRANTS AND CONTRIBUTIONS

Another source of municipal pay-as-you-go financing is intergovernmental grants and contributions received from the federal government, the provinces, other local governments, and regional municipalities. Typically, these contributions are one of three types: conditional grants dedicated to specific operating expenditures, which are generally unavailable to finance capital; unconditional operating grants, which could theoretically be transferred to capital but are typically retained for operating and maintenance purposes; and conditional capital grants dedicated to a specific capital purpose or capital project.

The traditional conditional capital grant typically requires municipalities to cost-share a portion of a specific project that meets with federal and/or provincial approval. In the past, federal and provincial funding in the form of the conditional capital grant constituted a significant source of regular and ongoing pay-as-you-go support for municipal infrastructure. But, they have been significantly reduced in the last 10 to 15 years, falling victim to budgetary restraint. Rather than forming an increasing and predictable source of pay-as-you-go financing, grants have become more ad hoc and limited to one-time infusions. With every federal and provincial budget, it seems cities wait with bated breath for any announcement respecting infrastructure funding. Further, many municipalities report difficulty raising their share for various cost-shared capital projects. Both the ad hoc nature of capital grants and the conditions for cost-sharing have reduced the effectiveness of grants as a pay-as-you-go tool, but they still remain a significant source of such financing.

D. INTERGOVERNMENTAL TAX REVENUE SHARING

A fourth source of municipal pay-as-you-go financing is a more recent phenomenon, and comes in the form of tax shared revenues from federal and provincial governments. The specific tax revenues shared vary widely from province to province, but generally include unconditional tax revenues for operating purposes that can be transferred to capital and conditional tax revenue transfers for specific capital projects. As with grants, the majority of this revenue is used on a pay-as-you-go basis. In some instances, tax shared revenue may also carry cost-sharing conditions where municipalities have to match the tax revenues received.

The specific advantage of tax shared revenue as a pay-as-you-go tool is its stability and predictability. While grants and contributions are decided upon annually as part of the federal and provincial budgeting process, tax sharing is typically in the form of an agreement stretching out for a number of years, and in turn, is a more secure source of pay-as-you-go financing than grants.

E. RESERVES AND RESERVE FUNDS

Municipalities maintain a group of operational and capital reserves built up through saving a portion of current revenues from previous years. Such revenues typically

include property taxes, user fees, development cost charges, and local improvement levies. These deposits earn interest and are later withdrawn to finance, or partially finance, a capital project. Municipal reserves typically come in two forms: discretionary or unrestricted reserves, which are general purpose savings accounts that can be used for almost any purpose such as property tax relief; and obligatory or restricted reserve funds established through a resolution or by-law to be used for a specific purpose or project.

Advantages

The use of capital reserves enlarges the pay-as-you-go financing envelope without increasing taxation. Reserves also play a key role in the planning and development of future infrastructure projects. As a result, the use of reserves and reserve funds constitute a significant and increasing source of pay-as-you-go financing for many municipalities. Because of increased infrastructure needs, many Canadian municipalities report they will turn to their capital reserves more aggressively in the future (Vander Ploeg 2003).

Disadvantages

Reserves and reserve fund financing is the exact mirror of debt-financing. As already noted, pay-as-you-go for large projects with long life spans can lead to significant intergenerational inequity—current taxpayers cover all the costs while future generations reap the benefits. The use of reserves and reserve funds compounds this inequity—both current as well as past taxpayers are now paying for infrastructure that will provide significant benefit to future generations.

Winning Conditions and Applications

Reserves and reserve funds can theoretically be applied to virtually any infrastructure asset. However, the intergenerational equity issue suggests a more limited application. Reserves are best used for assets with a shorter life span that need regular and ongoing replacement. For example, most municipalities maintain a set of replacement reserves for their vehicle fleet and other equipment. This helps municipalities to manage the relatively rapid turnover of these assets. Reserves are also used to collect funds in anticipation of a large infrastructure investment further down the road. Because of the equity issue, however, reserves should not be used to finance the full value of these larger investments. Reserves typically play a large role when it comes to user fees and pay-as-you-go. Annual collections of user fee revenue can fund a debt-

financing approach, but user fees do not typically provide enough up-front capital for pay-as-you-go. Thus, the creation of a reserve fund is one of the only ways that user fees can be married with the pay-as-you-go approach.

From a broader infrastructure perspective, reserves are really nothing more than a savings account, and can only be used as a stop-gap measure. It is important to remember that urban infrastructure deficits are an ongoing structural gap as opposed to a short-term cyclical shortfall. As such, only those measures that can provide a permanent stream of revenues can address the infrastructure challenge over the long-term. Further, many capital reserves have already been dedicated to funding specific capital requirements anticipated in the future. Priorities can always be shifted to accommodate new and emerging concerns—reserves could be redirected to fund some desperately needed large one-time infrastructure projects. But this remedy would only serve to open a gap in other infrastructure areas. In the end, capital reserves and reserve funds cannot be viewed as a sustainable or ongoing source of funding for infrastructure without first making some more basic choices about how to increase the size of those reserves themselves.

F. OPERATING AND CAPITAL LEASES

Leasing has become an increasingly popular way for governments to secure needed capital assets under difficult fiscal conditions. Traditionally, leasing in the municipal sector has taken the form of the operating lease, which is essentially a short-term rental contract. Through regular lease payments, the lessee purchases the right to use a capital asset for a specified period of time, while ownership of the asset remains vested with the lessor. From an accounting perspective, there is debate about whether operating leases constitute a form of pay-as-you-go or a form of debt financing. Historically, most leases were considered as off budget financing—lease obligations were not recorded on the balance sheet and lease payments were made out of operating not capital revenue. In short, leases were inherently pay-as-you-go.

However, this is not always the case. There are actually two types of leases. Pay-as-you-go is best reflected in a true operating lease. Under a true lease, the lessee has no intention of acquiring the property, even after the lease expires. At the end of the lease term, the lease is either

renegotiated and extended, the equipment returned, or a new lease for other equipment is signed. During the term of the lease, the vendor has responsibility for maintaining the asset, not the lessee (a gross lease). In a true operating lease, the asset is not used for most of its useful life and the total of the lease payments made do not pay for a significant portion of the original capital cost. True operating leases also tend to be relatively short-term and most contracts provide considerable flexibility to cancel the lease with little or no penalty. In short, there is little in the way of a future obligation that reflects debt with a true operating lease arrangement.

The financial or capital lease is much different. This type of lease is less reflective of the pay-as-you-go approach and more reflective of debt-financing since it creates a long-term financial obligation. Financial operating leases tend to be longer in nature and they cannot generally be cancelled. Once the lease is signed, the lessee has a legal obligation to continue lease payments. Most importantly, the lessee will either use the asset for most of its useful life, pay a significant portion of its initial cost over the lease term, or eventually acquire the asset itself through a lump sum payment for the fair market value (FMV) or a pre-determined option payment reflecting a fixed amount of the asset's original cost. The lessee is also responsible for maintenance of the asset (a net lease).

Advantages

Leasing has a number of advantages, the most important being cash conservation—substantially lower costs when compared to purchasing. The lower costs accrue for several reasons. First, one pays only for the value of the equipment used during the lease—the lease payments cover only that part of the capital asset that is actually being used. Lease terms are always shorter than the asset's useful life and typically run for less than a year to only a few years in length. Second, leases do not generally require a cash investment in the form of a down payment. Many leases can be 100% financed through regular payments. Third, since ownership of the asset always resides with the vendor, leases allow certain tax deductions, such as depreciation, to be passed on to local governments which are tax-free entities and cannot use this tax benefit without third party involvement. Fourth, governments can sometimes secure easier credit terms with a lease, such as negotiating a longer payment period. This results in even lower regular payments and eases pressure on cash flow.

Leases also increase purchasing power. Because lease payments are small compared to a straight cash outlay or borrowing to purchase an asset, lessees have increased capacity to leverage current dollars and secure more assets in a leasing package while increasing the payments only slightly. For example, a \$25,000 annual budget allocation can provide enough buying power to place \$100,000 to \$125,000 of new assets and equipment into service almost immediately. Put another way, annual budget allocations can be disbursed today dollar-for-dollar or they can be leveraged many times over by allocating the same amount to lease payments.

Leasing can also be a way to funnel expertise into a municipal operation. Leasing agencies know their equipment, can help identify needs and cost-effective solutions, and can provide expert technical advice. Leasing also provides a way to test-drive certain assets over the short-term before making a more long-term commitment. By using leasing companies and agencies, lessees can also acquire different types of assets and equipment from various vendors under a single lease.

Leasing is an effective way to lower the risk of asset obsolescence by providing opportunities to continually refresh technology and purchase better maintenance. Leasing can help keep operations current and secure newer and better equipment more often. The fact that maintenance is the vendor's responsibility not only results in fewer maintenance headaches but better overall maintenance as well—many governments have been unable to implement effective preservation practices with respect to many of their assets. In the end, leasing allows older and less inefficient equipment with high maintenance costs to be more easily taken out of service.

True operating leases can also help maintain the balance sheet. As already noted, some types of operating leases do not count as an ongoing long-term financial obligation or debt. Leased assets do not appear as an asset or a liability and are not generally booked as capital expenses. This can be a big plus, reserving debt capacity, keeping debt limitations intact, conserving capital revenue, and leaving other lines of credit untouched. Leasing is sometimes able to circumvent difficult capital budgeting problems or freezes in a capital budget.

In the end, leases appear as a convenient, quick, and relatively easy form of financing that often possess more flexible terms than loans or other forms of financing. Leasing allows governments to acquire the equipment they need when it is needed and to do so within the confines of the budget. Often, leasing allows more choice and more equipment at lower cost. This, combined with predictable payments, provides a hedge against higher priced equipment in the future due to inflation.

Disadvantages

The advantages of true operating leasing come at a cost. First, leasing precludes ownership. At the end of an operating lease, there is no tangible asset to show despite all the lease payments made. When an operating lease terminates, the lessee not only loses the right to use the asset, but also forfeits any residual economic value.

Second, while leasing results in lower up-front costs and small regular payments, the total cost at the end of the lease may be higher than purchasing, especially if the asset is used over a significant period of time. For example, a three-year lease on a computer worth \$4,000 at a standard rate of \$40 per month per each \$1,000 of value will cost a total of \$5,760. This is \$1,760 or 44.0% more than the original purchase price. Further, no equity exists in the computer at the end of the lease. Unless the computer has become obsolete at the end of the lease, the higher payments and the lack of ownership is a significant disadvantage. If a government has a continual need for an asset but decides not to purchase, then lease payments must also continue in perpetuity.

Winning Conditions and Applications

Leasing is a good alternative if a municipality's operating requirements are expected to change and if there is a lack of ready cash on hand for items that should be financed through pay-as-you-go. More specifically, operating leases provide the best fit for assets that are highly technological and carry a significant risk of obsolescence over a relatively short period of time. Suitable assets are relatively small, possess a short life span, and present a maintenance challenge. Leasing should generally be reserved for high priority assets and equipment. Leasing is a good fit for assets where usage is the most important consideration, but where ownership is not necessary or entails significant risks. Good examples of such assets include computer equipment and software, information

technology (IT) and computerized networks, specialized police, fire and EMS equipment, mapping, CAD, GPS, and GIS technology, communications systems, wireless data products, 911 emergency systems, security and surveillance systems, two-way radios, and various vehicles in the municipal fleet. A good candidate for leasing are those assets and equipment that can lower operating costs. The savings generated can go a long way in making the lease payments. Examples here include energy saving equipment such as new HVAC systems.

1.1.2. Innovative Pay-As-You-Go

A. EARMARKING CURRENT GENERAL PROPERTY TAX REVENUES

Earmarking refers to the budgetary practice of assigning revenues from certain taxes, or a group of taxes, to specific government expenditures. These earmarked revenues, typically called dedicated taxes in the US or hypothecated taxes in the UK, Australia and New Zealand, may also be supplemented by revenues from other sources (United Nations Secretariat 1995). Earmarked tax revenues are often accompanied and administered through trust funds and reserves, into which earmarked taxes are deposited and out of which expenditures are made.

The strategy behind earmarking is to regularly direct a certain amount of tax revenue toward an identifiable and high priority goal, carving revenue off from more general purposes and providing a guaranteed flow of income for a specific purpose. Earmarked revenues are kept distinct from general revenues, which can usually be spent on any legitimate purpose as decided in an annual budget.

With regard to pay-as-you-go and the current level and types of municipal taxation, earmarking can go forward in two ways. First, municipal budgeting practices can be changed to formally earmark a set portion of existing property tax revenues to support infrastructure. This would involve separating the current property tax mill rate into two components—an operating portion and a capital portion. Both components would appear as separate items on annual property tax statements. The City of Ottawa recently advanced this idea (City of Ottawa 2005). While it is conceivable to further earmark property taxes for specific purposes and

projects, this would be too narrow a focus, and is better left for specific property tax increases as opposed to the existing level of property taxation.

Second, a municipal budgeting policy could be framed to direct a portion of the revenue growth that accrues from expansion in the property tax base to general capital purposes. The City of Saskatoon has implemented this approach. Saskatoon currently allocates one-third of annual assessment growth to its capital base or pay-as-you-go envelope. Since 1998, the policy has resulted in an additional \$1.3 million in annual funding for capital on an ongoing basis.

Earmarking tools can be extended to include federal and provincial governments as well. Based on a preliminary analysis of the Canada Infrastructure Works Program (CIWP), for every \$1.00 spent on infrastructure by the three orders of government, 44¢ is eventually returned in tax revenue. The federal government receives 22¢, the provinces 17¢, and local governments 5¢ (Manitoba Heavy Construction Association 1998b). Because these revenue gains are a direct function of government infrastructure investment, there is an argument to be made for dedicating a portion of this fiscal recapture to additional infrastructure investments. This type of earmarking, which essentially plows tax revenue gains produced by successful infrastructure projects back into future infrastructure, could be very powerful. Currently, the State of California is considering an annual appropriation of 1% of all general fund revenues into a special trust for state and local infrastructure. The earmarked appropriation will continue indefinitely, unless annual growth in total general fund revenue slips beneath 5.0% (Commission on Building for the 21st Century 2001).

Advantages

From an infrastructure point of view, earmarking has a number of advantages. Earmarking shields and insulates infrastructure funds from various legislative and political pressures and provides greater stability and continuity of funding. This can facilitate the execution of projects and also reserve funding for the more difficult types of infrastructure spending, such as maintenance. In other words, earmarking helps infrastructure compete against program spending, whether that is policing, EMS response, or community social services. Earmarking also results in better accountability, which is always enhanced whenever there is a clear connection between a tax source and

an expenditure. This tighter connection allows governments to build more public support for specific projects if only because the outcome is more obvious. In many ways, earmarking reflects the benefits principle of taxation by drawing a direct link between costs and benefits.

Disadvantages

The biggest disadvantage to earmarking is how it creates rigidities in the budgetary process. Some argue that earmarking is inefficient, binding decision-makers to outdated priorities that can lead to over-investment in specific sectors and result in projects that are less economically and socially beneficial than other alternatives. To get around these difficulties, some jurisdictions have resorted to borrowing against surpluses in various earmarked trust funds and reserves to finance facilities that do not benefit from earmarking. This violates the principle behind earmarking and leads to even greater budgetary confusion.

Winning Conditions and Applications

Treasury and finance department officials tend to resist efforts at earmarking because it reduces discretionary budget-making authority. Yet, this is the very thing that makes earmarking attractive to the public. Thus, successful earmarking is very much a question of finding the right balance between dedicated funding and sufficient budgetary flexibility. This balance is not always easy to strike, but earmarking should not be circumvented as a response. Rather, reviews and efficiency audits of current earmarking practices should be conducted on a regular basis, and modifications made when appropriate.

Local governments in the US appear to have a much longer and stronger history of earmarking property tax revenues than local governments in Canada, despite the wide range of capital assets that can be financed in this fashion. The application for earmarked property taxes is virtually unlimited—it can apply to almost any type of tax supported pay-as-you-go infrastructure. In the US, it is not uncommon for property taxes to be split between general revenue, special revenue funds, debenture funds, and pension funds. Property tax revenues have also been dedicated to support specific operations such as convention centers or the construction sports stadiums. Much of the local transportation infrastructure is also financed in this way. Earmarked and voter-approved property taxation can

be found in cities like Minneapolis, New York, Denver, Detroit, Miami, Los Angeles, and San Francisco.

At the same time, only a small number of taxes can be practically earmarked in any one city at any one time. If earmarking is taken too far, it will undermine the principle of a unified budget, hamper effective budgetary control, and unduly infringe upon executive and political decision-making. Earmarking typically takes one of three forms, each differing in terms of degree. Tax revenues can be earmarked for infrastructure in general (i.e., the capital fund), for specific capital purposes (i.e., roadway rehabilitation), or specific infrastructure projects (i.e., a new sports stadium). Earmarking can thus be more general in nature or it can be highly specified. Local governments, therefore, have to decide what approach or which projects can best be financed through earmarking. In turn, that decision depends on the local circumstances in play.

B. INCREASE TAX RATES FOR CURRENT BASKET OF TAX SOURCES

Increasing property taxes to pay for needed infrastructure on a pay-as-you-go basis is a logical option. Property taxes have the advantage of being within the current jurisdiction of cities and there are no legislative restrictions on the amounts by which property taxes can be increased. Some argue that cities have created part of the infrastructure problem themselves by choosing not to raise property taxes. In other words, the infrastructure problem is to some degree self-inflicted—cities have placed themselves in a revenue crunch that has made it difficult to finance their long-term infrastructure plans.

This argument may have merit if only because zero growth in property taxes should not constitute the final goal of municipal fiscal policy. The property tax paid by individuals can increase regularly if it grows alongside incomes or some other measure of prosperity. The problem, however, is that conscious decisions to increase the property tax year over year, no matter how small, are not popular. A powerful barrier to small annual increases is the public perception that property taxes are already too high, although this is not necessarily the case (Vander Ploeg 2004b).

At first glance, there seems to be nothing innovative at all about increasing property taxes, or any other municipal tax for

that matter. But this ignores a multitude of innovative ways to expand taxation aside from passing the simple council budget resolution. Four methods come immediately to mind.

First, local governments can seek to expand property taxes by earmarking the revenues that accrue from the tax increase. This earmarking can be for general capital, specific purposes, or a large single project. Second, earmarked increases in property taxes can be submitted to voters in a municipal plebiscite or referendum. Voter-approved taxation is a common occurrence across the US, particularly at the state, county, and local government levels. Third, specific property tax increases can also be capped. It is not enough to vaguely suggest that property taxes should be increased to finance some new pay-as-you-go infrastructure project. Rather, the tax increase should be specified and the purposes clearly stated. Fourth, the tax increase can be temporary in nature. In the US, many earmarked and voter-approved tax increases carry a sunset provision—the tax expires after the purposes or the project for which the tax was implemented is completed. Upon expiration of the tax, local governments often present another project or capital plan, asking voters to renew the earmarked tax.

Advantages

Earmarking tax increases is a mechanism that can overcome resistance to new taxation. Experience indicates that voter approval of a tax increase can be positive if there is a specific plan for spending the additional funds, and that plan is clearly communicated to the electorate (United Nations Secretariat 1995). Earmarking provides assurances that the increase will not simply disappear into general revenue. In short, earmarking creates a nexus between what people are paying and what they are receiving. In this way, the tax becomes increasingly perceived as a user fee more than a tax proper (Department of Transport and Regional Services 2002).

By drawing taxpayers into the process, democratic participation is enhanced. In addition, voting provides taxpayers with an opportunity to better understand the reasons for a tax increase, and then pass judgement on the value of that tax increase relative to the purposes for which it will be used. Voter-approval forces elected officials and municipal administrations to thoughtfully prepare and sell a tax increase and related projects to the public. Taxpayers are more likely to support a specific tax increase accompanied with a specific

project, especially when the increase is capped and voters understand the tax will end after a pre-determined period has elapsed or sufficient revenue has been collected. Evidence in the US suggests that voters are inclined to approve such proposals, particularly when there is a detailed plan indicating what will be provided from the new revenues. It is the vague tax increase that is most likely to be defeated at the ballot box (Gunaydin, London, Peek, and Saltzman 2001). The Centre for Transportation Excellence in the US tracks various ballot measures for transit infrastructure initiatives.

Disadvantages

The downside to this approach is the possibility of a growing tendency for taxpayers to want every type of increase earmarked, and without appropriate safeguards in place, there is always the temptation to draw earmarked revenues into general revenues. However, the experience with many municipal self-financing utilities provides the guide. Earmarked user fees for infrastructure improvements in self-financing municipal utilities are employed in many Canadian cities already, and this is one reason why utility infrastructure (e.g., water and wastewater) tends to be in better shape than tax supported infrastructure.

Another downside concerns infrastructure that lacks visibility and carries a lower priority. Ballot measures affecting this infrastructure may run a higher risk of failure, and this may happen regardless of how desperately that infrastructure is needed. But this is not always the case. In the US, voter-approved tax increases are often married to a comprehensive capital budget plan that is submitted to voters as an omnibus bundle. Such ballot measures are often successful.

Winning Conditions and Applications

The earmarking of voter-approved tax increases that are capped and subsequently sunset are rare in Canada. But some cities engage in a similar process, and this provides a partial guide for the way forward. For example, the City of Vancouver regularly constructs a three-year capital plan that is submitted to voters in conjunction with regular municipal elections.

The methods for securing property tax increases can be used for virtually any type of tax supported infrastructure if the process is accompanied by a larger capital plan or is directed to general capital purposes. If the earmarking is project-specific, then the process is best reserved for certain

types of infrastructure since excessive earmarking presents its own problems. Ideal candidates are new and highly visible infrastructure systems that are linked to enhanced quality of life goals (National Guide to Sustainable Municipal Infrastructure 2002). In addition, the project should be sufficiently large and costly enough to warrant the additional cost and time of implementing the process. Projects for earmarking should also carry a high priority with the public.

C. LOWER/ELIMINATE EDUCATION PORTION OF PROPERTY TAX

A significant reduction or even elimination of the education portion of the property tax has been a long-standing position expressed by numerous municipalities and provincial urban municipal associations across Canada. For example, in 2001 the Alberta Urban Municipalities Association (AUMA) called on the government of Alberta to reduce education property taxes by 50%, thus freeing up \$650 million annually for municipalities in the province (Alberta Urban Municipalities Association 2001). The idea behind this move is for the provinces to back out of the property tax and provide municipalities with the freedom to move in and use the vacated tax room to finance infrastructure.

A move to eliminate the property tax as a funding source for education would be quite innovative. Because property taxes have funded education in Canada for over a century, this would be a significant change in tax policy. If the vacated tax room were specifically earmarked for infrastructure, the level of innovation involved would increase.

Advantages

The advantage of this approach for municipalities is clear enough. Not only would it provide additional pay-as-you-go tax revenue, but it does so without municipalities having to make the difficult decision to increase taxation. That decision would be left to the provinces, which would be forced to increase taxation elsewhere to cover the resulting revenue shortfall in education. Because this approach is a win-win for the municipalities and a lose-lose for the provinces, it is easy to understand why municipalities have been advancing the cause, and also why the idea is having such difficulty getting traction. The most that municipalities have been able to score on this front is provincial agreement to limit educational property tax increases, tie future increases to the costs of inflation, or have them simply level off over time.

Disadvantages

The long-term benefits of such a move are not clear. The move would only exacerbate the current municipal over reliance on this one tax source, and all the disadvantages that come with it. In the long-term, municipalities would likely be better off in having access to a more diverse tax regime directly, as opposed to increasing their reliance on the property tax. More important, the property tax itself has helped to fuel infrastructure deficits. Without reform of the property tax system and sufficient tools to address free-riding, increased reliance on the property tax, as currently administered, may only reinforce these incentives.

Winning Conditions and Applications

More property tax room would allow municipalities to increase the amount of pay-as-you-go financing across all forms of tax supported infrastructure. Despite this, the sheer magnitude of the infrastructure shortfall, the need to raise taxes at the provincial level, and the limitations of the property tax mean that the potential impact of this approach is limited.

D. POLICY TO ADDRESS REVENUE INELASTICITY

It is generally conceded that property tax revenues across the municipal sector have not kept pace with inflation or growth in populations and incomes (Vander Ploeg 2004b). One idea is to employ a variant of the US-style tax and expenditure limits (TEs), which prescribe the amount by which property tax revenues can grow year over year. In the US, TEs are designed to cap property tax revenue growth. But they could also be used in the other direction to form the basis of a new guiding principle for municipalities—an explicit policy of ensuring property tax revenues keep pace with incomes or some other measure of economic growth. For example, a city could pass a standing policy stating that property tax revenues should represent 3% of the total incomes earned in the city on an ongoing basis.

Advantages

This innovation revolves around modifying current budget practices. Such a standing policy would remove some of the political wrangling over annual tax increases and limit the public and media's tendency to see every increase in the property tax mill rate as a tax increase when it may not be an increase relative to incomes. In most municipalities, debate over property tax levels are an annual occurrence at budget

time. In fact, it is this aspect of municipal budgeting that tends to receive the most attention.

A standing policy would limit these debates and allow councils to focus their decision-making on where and how to employ the tax revenues at their disposal. This is quite different than the current process where municipal decision-makers are always gauging how much tax revenue they think they can get away with politically to finance and fund the infrastructure that the city administration tells them they need. A standing policy would be more reflective of the budget dynamic facing federal and provincial governments, who at budget time are essentially confronted with one basic decision—how to live within their fiscal means. With municipalities, too much time is spent first deciding what those fiscal means should be. In other words, how much property tax should we collect? The logical answer to that question lies in the happenings in the broader economy, especially incomes, and a standing policy can help address that question over the long-term.

Disadvantages

This option does little to address the lack of diversity in municipal tax sources, and also presents negative implications for taxpayers with low or fixed incomes. Relating the total amount of property tax collected to total income in a city provides only an average measure of the property tax burden—constantly rising property taxes will still negatively impact lower and moderate income families.

Winning Conditions and Applications

At the same time, the idea should not be summarily dismissed. Many municipalities have in place a system of property tax rebates and other measures to address the impact of property taxes on those with low or fixed incomes. Any policy to ensure adequate levels of property tax revenue could fall back on these tools to mitigate unwanted social and economic consequences. Like all the various property tax options discussed so far, this one has applicability across a wide swath of infrastructure. However, applicability can be both narrow or wide depending on whether such a policy is coupled with other tools such as earmarking.

E. CREATE STRATEGIC RESERVES AND RESERVE FUNDS

It is not immediately clear how innovative infrastructure finance links up with the use of reserves since they basically amount to a savings account in which various sources

of revenue—innovative or not—are deposited. Yet, there appears to be two emerging approaches to reserves that do offer a slight innovation. First, reserves are obviously used in conjunction with earmarked property tax increases. Municipalities across the country are now experimenting with recapitalization reserves which are created to collect, manage, and administer earmarked property taxes that have been dedicated to rehabilitating existing infrastructure. The recapitalization levy appears as a separate line item on annual property tax bills. Second, the notion of the replacement reserve is increasingly coming into vogue.

Advantages

Both of these reserves can help facilitate capital asset management and life-cycle costing by encouraging governments to consider how new asset purchases will eventually be replaced. Infrastructure analysts advise that cities should be spending from 2% to 4% of the replacement value of all of their assets on a regular basis for maintenance and rehabilitation (Vanier 2001). Assuming a 50 year lifespan across the full range of asset types, another 2% is needed for assets to be replaced at the end of their serviceable life (Vanier 2000, BDO Dunwoody and Associates 2001). Recapitalization and replacement reserves are two mechanisms that can help manage these future needs.

Disadvantages

The main problem is obvious—how to free up a certain amount of revenue today for expenditures that are 20, 30, or even 50 years out. In addition, issues of intergenerational equity remain.

Winning Conditions and Applications

The challenge here is in finding both a balanced approach to reserves and the requisite funds to put into reserve. Perhaps all that can be said is municipalities need to ensure that new infrastructure projects have built into the up-front costs at least some consideration of the annual funds that must be invested into reserves for maintenance, as well as eventual rehabilitation and replacement. For the most part, recapitalization and replacement reserves are intended to address a variety of needs. Replacement reserves are a good fit for assets with a short life span. Recapitalization reserves are particularly helpful for the rehabilitation and renewal of existing infrastructure assets such as local streets and sidewalks (National Guide to Sustainable Municipal Infrastructure 2002).

F. LEASE-PURCHASE-FINANCING

In recent years, the concept of leasing has been expanded to embrace a number of unique innovations that widen its applicability as a pay-as-you-go tool. One of the most important and fastest growing innovations is lease-purchase-financing, or the full payout lease, conditional sales contract or installment sales agreement. Lease-purchase-finance agreements combine the standard operating lease with a financial capital lease in such a way that governments can acquire the use and ownership of assets and equipment, but the lease itself does not constitute debt for accounting purposes. Lease-purchase-financing accomplishes this by incorporating several features that provide for significant flexibility—features that are not generally built into the standard operating or financial capital lease.

Lease-purchase-financing differs from the standard operating lease and the traditional financial capital lease in several ways. Unlike an operating lease, a lease-purchase-financing contract is not a rental—it anticipates full ownership of the asset. In a lease-purchase-finance agreement, the lessee acquires the ownership of various assets and equipment using funds provided by a lessor. The lessee agrees to repay those funds, along with interest, over a set period of time. The lease payments are thus made up of amounts to cover both principal and interest to the lessor. With each lease payment, the lessee increases its equity interest in the asset. At the end of the lease, the lessee receives clear title to the asset.

Unlike the standard financial capital lease, a lease-purchase-finance agreement has the lessee owning title to the asset upon signing the lease rather than at the end of the lease term. During the lease, the lessor retains a security interest in the asset only. At the end of the lease, there is no residual balloon or option payment to be made. Most important, lease-purchase-finance contracts are not typically recorded as debt on the balance sheet.

The reason that such lease arrangements do not constitute debt has to do with the flexibility provisions they contain. Most important is the non-appropriation clause contained in lease-purchase-financing contracts. In the contract, the future obligation to make lease payments is subject to an annual appropriation of funds out of the municipal operating budget. At any time, a government can cancel a lease-purchase-

finance contract by simply not appropriating the funds. As such, a lease-purchase-finance agreement amounts only to a series of annual obligations that are not typically considered as debt. Lease-purchase-financing allows governments certain rights to terminate the contract, and to do so without suffering a prescribed penalty other than losing the equity that may have been built up in the asset.

The lessors in a lease-purchase-finance contract typically protect themselves in the case of non-appropriation in two ways. First, an interest rate premium is charged, which is usually about 2%-3% higher than the going bond rate. Second, many leasing companies restrict these agreements to certain essential use equipment that a municipality cannot do without. However, since non-appropriation risk has proven to be quite low, many leasing companies are now offering lease-purchase-financing for non-essential use equipment as well.

A noticeable feature of lease-purchase-finance is how it can be customized to fit a variety of needs, particularly with respect to lease payments. Lease-purchase-finance contracts allow payments to be made monthly, quarterly, semi-annually, and even annually. Within this broader framework, lease-purchase-finance agreements can incorporate a deferred payment clause, which allows for a significant grace period before the first lease payment is due. Under a deferred lease plan, a government can sign a lease in the current year even if no money has been appropriated in the budget. Another variant is the step-up lease. A step-up lease starts with low payments that increase over time. This approach is beneficial for assets that may not generate revenue at the outset but will become more productive over time.

The step-down lease is the opposite of the step-up lease. A step-down lease starts with high payments that diminish over time. This approach is less relevant for government, but it is attractive for businesses that want to accelerate tax write-offs associated with the lease. Under a skip lease, payments can be skipped at specified points in the year to allow for better cash flow synchronization.

Lease-purchase-finance agreements are financed through a third party. With smaller transactions, the financing can be carried out through a leasing company, an independent financing company, a commercial bank, or an insurance company. Larger transactions usually involve a number of

investors who acquire the rights to receive the lease payments through Certificates of Participation (COPs). With a COP, a securities firm underwrites a public offering or a limited placement with institutionalized investors. Such offerings are generally issued in units of \$5,000. The securities firm then markets the lease to a larger pool of investors, much like a municipal bond offering. There are many other lease financing vehicles as well, such as lease-purchase-bonds, lease-payback-bonds, lease-revenue-bonds, and leaseback-financing-bonds.

The lease-purchase-finance concept comes in a number of variations. In the US, one of the most important is the municipal-lease-purchase-finance agreement. With a lease, the interest portion of a lease-purchase-finance agreement is exempt from federal—and sometimes state—taxation. This provides the lessee with a cost savings relative to the more conventional and taxable commercial financing. Because lessors do not have to pay federal and state income taxes on municipal leasing interest income, rates are typically 30-35% less than commercial borrowing rates. But, the rates are still slightly higher than the going municipal bond rate—usually about 2%—due to the risk of non-appropriation. But even if the lease involves a higher interest rate, many municipalities are willing to pay because of the reduced transaction costs that can accrue under a lease.

Another variant is the guaranteed savings lease. This type of lease-purchase-finance arrangement assures lessees that annual lease payments for certain equipment will not exceed the cash savings generated by them. An example of this arrangement is the energy service performance contract or ESPC. Under such contracts, a building owner enters into a lease-purchase-finance arrangement for some energy saving equipment or modifications to the building. If the annual energy cost savings are less than the annual fixed lease payments, the lessee pays only the amount saved or receives a credit for the difference.

Under a master lease arrangement, municipalities can keep the option open to add more equipment to an existing lease without incurring the hassle and costs of negotiating a separate lease agreement for each addition. Master leases are quite convenient and useful when governments have an equipment acquisition program extending over several years or have not yet identified all of the assets or equipment they need.

Advantages

Lease-purchase-financing carries a number of advantages as a pay-as-you-go tool. It tends to match financing with the useful life of assets. This is preferable to forcing an asset to be financed far beyond its useful life, which can sometimes happen with debt financing, or well below its useful life, which always occurs when assets are purchased on a cash basis. Because lease-purchase-financing avoids a full cash outlay associated with traditional pay-as-you-go, governments can also leverage additional assets and equipment without incurring debt. This means more assets and equipment while debt capacity is reserved for other infrastructure projects. A powerful example of this comes from the Missouri Department of Transportation (DOT), which had budgeted for 85 new road maintenance trucks. The same budget allocation was eventually leveraged with a lease-purchase-finance contract to acquire 477 new trucks. This significant addition took the existing 1,900 fleet of trucks from an average age of 19 years down to 9 years and considerably lowered anticipated maintenance costs (International Truck and Engine Corporation 2006).

Lease-purchase-financing is very flexible and can be adapted to meet the unique budgetary needs of almost any municipality. The tool represents an opportunity for customized solutions, particularly with respect to variations in cash flow. Since municipalities also own the asset from the outset of the lease, there are no special maintenance or return provisions that exist under more conventional lease arrangements. Vendors can also help with pre-funding certain assets. The government sector often has a need for specially-designed and configured equipment that must be pre-funded to a potential vendor before manufacturing begins. Some leasing companies can help with this pre-funding and roll it into the subsequent payments. One of the latest developments with lease-purchase-financing is web-enabled asset tracking, which offers customized data capture and reporting on assets that have been leased. This tracking can form part of a larger management plan, and is currently available across North America, Australia, and New Zealand, and will soon be made available in Europe.

Lease-purchase-financing is a quick, simple and relatively low cost pay-as-you-go option. Under most lease-purchase-finance agreements, 100% financing is available. Lease payments can also be all inclusive, capturing the costs of

delivery, training, shipping, installation, related software, maintenance, and a range of other soft costs. In short, lease-purchase financing allows municipalities to finance only what they need when they need it, acquiring today's equipment with tomorrow's dollars.

Disadvantages

At the same time, two particular disadvantages do stand out. First, governments obviously run the risk of losing the accumulated equity in a leased property if funds are not appropriated annually. This risk remains even if no other financial penalty results under the lease. Second, the effective interest rate under a lease-purchase-finance contract is usually higher than a regular municipal debenture or bond. While this increases total costs when compared to bond financing, the higher interest rate may be worthwhile depending on the asset in view. It is hardly efficient, for example, to fund numerous but relatively small assets with multiple bond issues, which involve a number of up-front costs such as underwriting fees, insurance costs, and other legal expenses. Bonds also take considerable staff time to complete. In this instance, the higher interest rate premium can be offset by other savings. In the end, effective leasing strategies have been shown to still reduce the total cost of ownership for certain assets by as much as 10%-15% (HP Financial Services 2006).

Winning Conditions and Applications

The usage of lease-purchase-financing by local governments is very much an American phenomenon and is used in more than half of all US states. To a large degree, lease-purchase-financing has emerged in response to some of the stringent limits that have been placed on other 'pay-as-you-go and debt-financing tools. In many states, for example, local governments have seen voter-approved constitutional or legislative caps placed on their property tax revenues. The most famous of these initiatives is California's Proposition 13, enacted in 1978. In the US, many local governments also suffer under highly restrictive constitutional or legislative limitations on bonded indebtedness, and cannot issue general obligation bonds without seeking prior voter approval. Lease-purchase-financing and the various bonding arrangements such as certificates of participation, lease-purchase-bonds, lease-payback-bonds, public-lease-revenue-bonds, and leaseback-financing-bonds are not subject to these conditions. Lease-purchase-financing developed as an alternative to seeking

voter approval and also to circumvent certain limitations imposed on other financing tools.

The lease-purchase-financing tool generally applies to the same list of assets and equipment that can be secured through the traditional operating or financial capital lease. But with lease-purchase-financing, the list can be radically expanded to include those assets and equipment types where immediate ownership is a priority concern. The list for lease-purchase-financing can also include larger and more expensive assets.

Across the US, municipalities lease-purchase-finance everything from the vehicle fleet (e.g., buses, LRT cars, police vehicles, ambulances, fire apparatus, road building and maintenance equipment, snow removal and street sweeping equipment, garbage trucks, mobile command centres, water trucks, etc.) to computers and communications hardware and software and even the lowly office copier. Larger assets that have been lease-purchase-financed include modular buildings, schools and classroom additions, permanent and portable dormitories, hospitals and clinics, port facilities, justice and detention centres, courthouses, prisons, parking garages, recreational and leisure facilities and even large municipal water systems and wastewater treatment facilities.

However, lease-purchase-financing tends to be restricted to assets that have a life cycle of between 3-10 years. Municipalities have found that the tool is generally cost-effective only for terms under 10 years and where total costs do not exceed \$10 million. In the US, lease-purchase-finance has been specifically targeted to finance assets that have a low priority with the public or where it is difficult to secure voter approval for municipal bonds. These types of assets include things like law enforcement and local lock-up facilities.

G. LEASEBACK ARRANGEMENTS

The final innovation with pay-as-you-go involves yet another variant on the leasing concept—the leaseback arrangement or safe harbour lease. In a leaseback, a municipality either sells or leases a new asset it has purchased through a pay-as-you-go approach, or sells or leases an existing asset, to a private third party. The municipality then leases the asset back over a period of time. If the asset was sold to a private partner as opposed to leased, the municipality eventually re-purchases the asset at fair market value after the leaseback arrangement expires.

Leasebacks come in all shapes, sizes, and flavours, but all of them share one fundamental feature—they are invariably complex. In the interest of simplicity, we refer to three broad types. In the purchase-lease-leaseback scheme, a municipality purchases a new asset, leases it to a private firm, and then leases the facility back. In this scenario, the municipality retains ownership of the asset at all times. In a hypothetical example, assume a municipality purchases an asset for \$150,000. The asset is then leased to a private firm for the same amount. Because of the tax benefits open to the private firm, the total net cost to the private sector might be \$145,000 over the term of the lease. The private sector leases the asset back to the public sector for \$147,500. Under such an arrangement, the public partner saves \$1,500 on the transaction and the private sector makes \$1,500. The leaseback approach also works for existing assets in need of rehabilitation. In this scenario, a municipality leases out an existing asset, and then leases it back with the improvements—a lease-leaseback scheme. The leaseback terms are more favourable due to the tax benefits passed on by the private firm that re-developed the asset.

A purchase-sale-leaseback-purchase scheme sees a municipality purchasing a new asset and then selling it to a private firm, which then leases the asset back to the municipality. At the end of the lease, the municipality can re-purchase the asset for its fair market value. This approach tends to be more common with existing assets in the form of a sale-leaseback-purchase agreement. The advantage of this approach is how it generates a large up-front payment from the sale of the asset. These monies are often invested, with a portion of the annual income being used to finance other projects and the remainder retained to facilitate the future re-purchase of the improved asset. The up-front payment, together with the lower lease payments due for the refurbished infrastructure, can result in lower cost financing than the standard municipal bond.

A final variant on the leaseback idea is the cross-border-tax lease. This approach basically follows the leaseback scenarios above for the purchase of new assets and equipment, but has governments searching the globe for private firms in other countries willing to participate. The idea is to take advantage of even more lucrative tax deductions that may not be available domestically. Some countries, for example, have more generous investment tax credits that can be passed on through a leaseback arrangement.

Advantages

The intent behind a leaseback arrangement is for a local government to benefit from certain tax deductions available only to the private sector. Whenever a private firm purchases or leases equipment, it becomes eligible for a range of tax credits including depreciation of the equipment as a business expense, deductions on interest paid for capital assets, investment tax credits, and other deductions. In a leaseback arrangement, these tax savings are passed on to the municipal lessee in the form of lower lease payments—payments that the lessee might not be able to secure when acting alone or even purchasing the asset through borrowing. The arrangement is also beneficial for the private firm, which makes a reasonable profit from the various tax implications.

Disadvantages

While the advantages of a leaseback are quite obvious from a financing perspective, so are the disadvantages. Leaseback arrangements are very complex undertakings that involve high transaction costs, substantial risk, significant negotiation, and require highly-skilled international legal and financial expertise. All of this would appear to limit the applicability of leaseback to larger assets with higher up-front costs. But leaseback is also well-suited for smaller assets with shorter-life spans and where competitive pricing exists. When used for these assets, the high transaction costs exacerbate the level of risk. This risk is further compounded by the fact that savings are typically well under the 10% range.

If a local government has temporarily sold an asset—as opposed to leasing it—a re-purchase of the asset will have to be negotiated when the lease expires. Because this re-purchase cannot be determined in advance, many accuse the leaseback as being privatization by stealth. Clearly, much depends on the specific provisions, options, and legal obligations affecting re-purchase. In the absence of such language, the sale-leaseback-purchase is more rightly described as a sale-leaseback. These types of arrangements come very close to privatization.

Winning Conditions and Applications

Successful leasebacks require a high level of analysis and disclosure, and need to be accompanied by a well defined repayment schedule and a careful consideration of the implicit costs of interest so valid comparisons can be made with regular debt financing or reserve financing. In negotiating a

leaseback, municipalities must secure independent financial and legal advice that can help with identifying a range of financial and legislative issues including the effects of future changes in federal or provincial taxation, and in the case of cross-border-tax-leasing, the management of foreign exchange risk and exposure (Brittain 2002).

Leaseback arrangements have tended to show the most promise with respect to publicly-owned buildings such as performing arts centres, theatres, concert halls, central libraries, museums, historical sites, university and college dormitories, large integrated recreational centres, convention centres, city halls, and stadiums. Depending on the asset, leaseback arrangements typically run from between 15-35 years. At the same time, their usage continues to expand, particularly in the US. Leaseback schemes are going forward across the utility sector as well, touching such systems as water treatment and distribution, wastewater treatment, solid waste disposal, power stations, airports, and ports and harbour fronts.

One area that is growing in particular is the use of cross-border-tax-leasing for transit purposes, especially the rolling stock for LRT systems. In Toronto, for example, GO Transit has a leaseback arrangement with a US firm company because of the more favourable tax breaks overseas (Irwin and Carpenter 2005). The lease involves 368 subway cars for the Toronto Transit Commission. The Cross-border-tax-lease was expected to reduce financing costs by \$40 million on a total purchase of \$850 million (Brittain 2002).

SUMMARY OF PAY-AS-YOU-GO

Following a pay-as-you-go infrastructure financing strategy across the board is an unduly conservative approach to infrastructure financing, particularly when considering large projects with high up-front costs and long life spans. Pay-as-you-go has a role to play, but only with respect to highly technological infrastructure that runs the risk of obsolescence, as well as smaller groups of assets that carry lower initial costs and possess shorter life-spans. There are a number of innovations that offer the prospect of increasing the pay-as-you-go financing envelope. These innovations range from the modest practice of earmarking current sources of taxation, separating budgets into operating and capital components, and coupling earmarking with voter approval, rate caps, and

sunset clauses to secure public approval for modest increases in taxation. More radical innovations include a standing policy to address the lack of property tax revenue growth and municipal-lease-financing and leaseback arrangements.

1.2. Borrowing

If a company attends only to reducing debt and paying dividends to shareholders while failing to re-invest in productive capital, it may be able to produce a few years of impressive financial results, but at the expense of its long-term health. So too it is with governments...

—Athol Yates (Yates 2002)

Reluctance to use the medium term fiscal policy flexibility that governments have earned may prove to be very expensive in time. There is increasing evidence that we are taking more risk to wellbeing in terms of the safety of economic prosperity as well as personal safety of people in the community because of under-investment in infrastructure. ... While the objective of a sustainable level of public debt is a valid one, the objective of zero debt does not make economic sense.

—Allen Consulting Group (2003)

The problem with the logic of 1990s fiscal policy was that it was based on a superficial attraction that less debt is better debt. But just as an individual, family, company, or local authority can have too much debt, it can have too little.

—David Cunliffe, MP (Cunliffe 2002)

Historically, borrowing was a standard financing approach used by municipalities across Canada. From the 1950s to the early 1980s, borrowing was arguably the single largest source of financing for major infrastructure investments. Borrowing provides a source of instant funds by capitalizing future cash flows to the present. These funds, plus interest, are then slowly repaid over the life of the asset. In more recent times, particularly following the fiscal belt-tightening of the 1990s, borrowing on the public credit suddenly became almost universally despised. The conventional wisdom of the 1990s asserted that all government expenditure, including capital, should be met out of current and continuing revenues with no net borrowing.

That wisdom is excessively conservative. Expanding corporations with a strong balance sheet borrow. Indeed, it is sound business practice to finance productive assets with debt. The same applies to local governments.

Indeed, having no debt is not the litmus test for fiscal responsibility. Fiscal responsibility involves balancing the operating budget over the business cycle and maintaining or increasing financial net worth in the medium-term. None of this, however, is an argument against borrowing for capital, especially when that borrowing is used for infrastructure assets that should not be financed with a pay-as-you-go approach.

Local governments must avoid becoming overly indebted and ensure that debt levels are sustainable and can be tolerated within the operating budget. But the debate has swung too far, and it has resulted in the cutting off of a major source of infrastructure financing. In many ways, it is no big surprise that municipalities are reporting significant shortfalls in their infrastructure.

In the end, a completely debt-free city should never be the ultimate goal of fiscal policy, regardless of how well it plays politically. This is especially the case if the trade-off is an underfunded stock of capital assets. The pay-as-you-go approach is arguably better for a city fiscally, but it does not always contribute to the overall health of a city, which certainly encompasses more than the balance sheet.

Advantages

The immediacy of borrowing is a significant advantage when it comes to infrastructure. Debt-financing is a source of instant revenue, providing governments with significant funds to move rapidly and meet increasing demands. As such, borrowing allows desperately needed infrastructure projects to proceed today as opposed to deferring them until enough pay-as-you-go funds have accumulated. Borrowing does this by easing the inevitable cash flow problems that surround large investments. Debt-financing avoids unnecessary delays, which is a noticeable disadvantage with the pay-as-you-go approach.

Borrowing also smooths infrastructure investments by spreading the costs over time. To the extent that the term of the borrowing matches both the economic and physical life of an infrastructure asset, debt-finance is both effective and efficient (Dowall 2000). One study evaluating infrastructure finance in Australia concluded that out of all the available methods of financing infrastructure, government debt is the most economically beneficial and efficient (Allen Consulting Group 2003). Debt is a particularly good financing approach

if it also levers more capital dollars elsewhere, whether that be federal and provincial grants or participation from the private sector. Debt-financing also frees up funds for infrastructure that is better financed under a pay-as-you-go approach.

With all that said, the primary advantage of debt-financing is still its ability to promote a measure of intergenerational equity in the financing of infrastructure. Debt-financing allows future generations who stand to benefit from infrastructure with a long life span to also contribute financially through interest and principal costs that will be paid down the road. Unlike pay-as-you-go financing, debt allows the cost of infrastructure to be shared between the generation doing the building today and future generations who also stand to benefit.

Disadvantages

Public debt is often criticized for how it competes and crowds out desirable private investment by increasing the costs of financial capital. This argument does have merit when considering huge public borrowings to finance a structural and ongoing government operating budget shortfall, but it is less relevant when considering infrastructure. Whether infrastructure is developed with borrowing by the public or the private sector, the same amount of capital is required (Yates 2002). Furthermore, the private sector needs public infrastructure. Without it, the private sector's investments will be less productive.

Another popular criticism against public borrowing is the interest charged on outstanding debt and how it increases the final costs of infrastructure. While this complaint has attracted numerous proponents, it ignores three facts. First, debt-financing infrastructure today avoids having to pay for the inflation that will increase the cost of that infrastructure tomorrow. Inflation alone can double or even triple the costs of infrastructure over a 20 year wait time (Federal Highway Administration 2004). Second, debt is largely repaid with dollars that are worth less than when the debt was incurred. Again, this is due to inflation. So while interest will cause the total nominal cost in the end to increase, the cost in real inflation-adjusted dollars is much lower. Third, as time progresses, any debt incurred, and the interest that accompanies it, becomes less and less onerous as the local population grows, the economy and local tax base expand, budgets increase, and incomes rise. Funding the first few

years of a large long-term bond may indeed be tough, but the pressure inevitably eases with time. So while debt carries a cost in terms of interest, that cost is more than offset by inflation, population growth, and future economic expansion.

Winning Conditions and Applications

Most analysts concede that if the local economy is expanding and per capita incomes are rising, then it is less expensive to borrow for infrastructure, despite the interest, than to pay for it up-front (Infrastructure Canada 2004). Most of the real disadvantages with debt start to bite only when governments begin borrowing excessively and the growth pattern becomes unsustainable given the current and future dynamics of the larger budget. This is especially so when considering tax supported debt. Borrowing can be considered excessive and unsustainable if levels of tax supported debt are steadily increasing, year after year, at a rate above the growth in operating revenues out of which the interest and principal must be repaid. Eventually, this will result in higher taxes down the road, particularly if the assessment base and personal incomes are not expanding sufficiently to accommodate the steadily rising debt levels.

Continually increasing levels of tax supported debt that are growing faster than tax revenues will also begin squeezing out other program and future capital priorities and also reduce the amount of discretionary spending in the operating budget. If debt is relied upon too heavily, it will also negatively impact a government's bond rating, which results in higher borrowing costs and more difficulty in attracting investment. Huge debts incurred in the past also limits debt as a tool for the future. Excessive borrowing across the public sector can also introduce inflation into the economy, resulting in higher interest rates.

To mitigate these concerns, governments need to strike a balance with debt. Too little debt can severely restrict the funds available for financing infrastructure, while too much debt is fiscally unsustainable over the long-term. Prudence requires finding the mid-point.

Debt-financing is the logical alternative for those assets that do not provide a good fit with pay-as-you-go. Debt-financing is best used for infrastructure assets where the benefits accrue to the current generation as well as future generations. Such infrastructure is large, has a long life span, a long payback

period, high up-front costs, and long construction periods. Debt-financing is more easily applied to infrastructure assets that carry a high priority rating with the public, and are also highly visible.

Debt-financing is particularly suited for assets that will generate measurable social and economic benefits to a community, and where those benefits are widely expected to exceed the costs of the debt-financing. Refusing to debt-finance such infrastructure involves a delay, which in turn results in a loss of community welfare. In the public sector, this is often hard to measure, but it does form a basic ground rule. When pay-as-you-go will result in a significant delay for an infrastructure that will provide clear economic or social benefits, then borrowing needs to be seriously considered.

Debt-financing is the most appropriate for one-off strategic capital expenditures that are non-recurring in nature. This reflects a basic principle behind infrastructure finance, which is to match the financing source with certain expenditure types. In many ways, debt-financing is a one-time revenue source if only because there is always a limit to how much can be borrowed. As such, one-time revenue sources should be employed for unique and non-recurring capital projects, and ongoing sources of financing and funding need to be employed for ongoing capital needs. Typical one-off capital projects can include the construction of new assets to enhance service, new assets to accommodate growth, and the rehabilitation of existing assets or capacity expansion. When these types of infrastructure spending are financed with debt, then pay-as-you-go funds are freed for ongoing and recurring infrastructure obligations such as maintenance and preservation.

Debt-financing should always be considered for infrastructure that is inherently marketable. With marketable assets, the debt will be essentially self-financing through user fees. Refusing to apply debt-financing for marketable infrastructure results in a waste of precious pay-as-you-go dollars that would be more effectively employed elsewhere.

Typical municipal assets that are prime candidates for debt-financing include large buildings such as libraries, museums, city halls, police, fire, and EMS facilities, and recreation centres. Open access parks, roadway infrastructure, and LRT

transit systems are also good examples. Major municipal utility systems, especially water and wastewater treatment, collection, and distribution are perhaps the best candidates for debt-financing since they are marketable assets.

1.2.1. Traditional Borrowing

The list of traditional urban debt-financing tools can be split into two broad categories: short-term borrowing and long-term borrowing. Of the two, long-term borrowing is given the most attention since infrastructure is seldom financed through short-term debt, which is usually reserved for intermittent gaps in operating cash flow.

A. BANK FINANCING (Short-Term)

Most municipalities in Canada have a set of liabilities owed to various commercial and institutional lenders to cover short-term fluctuations in operating cash flows. Such bank financing is generally restricted to under a year. Often, these amounts are really the balance outstanding on a line of credit that can be drawn down when needed. With regards to infrastructure, this borrowing tool is of little relevance, with the possible exception of bridge financing—short-term loans used to keep construction projects on track when problems arise with a longer-term source of financing.

Advantages

Bank financing for short-term needs is relatively simple and easy. Often, these amounts are really the balance outstanding on a line of credit that can be drawn down whenever needed. Compared to other alternatives, bank financing for short-term needs involves low transaction costs.

Disadvantages

In the broader world of infrastructure finance, short-term bank financing is of little relevance, with the possible exception of bridge financing—short-term loans used to keep construction projects on track when problems arise with longer-term sources of financing.

Winning Conditions and Applications

The use of bank financing is relatively straight forward, and need not overly concern us here. Its application is to cover short-term fluctuations in operating cash flows.

B. NEGOTIATED BORROWING (Short-Term)

Some municipalities also negotiate relatively short-term loan arrangements with private parties, particularly for infrastructure needed to accommodate growth and new residential or commercial development. This usually involves a private developer or property owner financing a portion of the infrastructure. Developers and private property owners are sometimes willing to undertake this type of short-term financing if it can smooth the path for development. Such approaches can be more flexible than commercial bank financing and benefit both the municipality and the private party. At the same time, municipalities should have in place a set of processes and procedures regulating such financing to guard against any public perception that land-use designations are being circumvented or zoning and re-zoning approvals are somehow being bought.

Advantages

Negotiated borrowing over the short term can be more flexible than commercial bank financing, and benefit both the municipality and the private party. For government, the benefit accrues from placing the onus on the private party to arrange financing, and for the private party, the arrangement allows development to proceed at a faster rate.

Disadvantages

Governments must guard against having their decision-making skewed by such arrangements and also work to ensure that land-use designations are not being circumvented and that zoning or re-zoning approvals are not being bought. The amounts involved must also be substantial enough to warrant the transaction costs of negotiating such borrowing.

Winning Conditions and Applications

Negotiated borrowing with private parties can be used to finance a wide range of new infrastructure needed to accommodate growth. To guard against abuses, municipalities should have in place a set of processes and procedures regulating such financing.

C. REGULAR AMORTIZED DEBENTURE BOND (Long-Term)

In the Canadian municipal context, infrastructure debt-financing has traditionally taken the form of a serial debenture bond with regular repayments of interest and principal over a

specified period. The terms of these debentures usually run in the 10 to 15 year range, with 25 years constituting the general maximum. Some cities also have a practice of employing sinking fund debt, a type of debenture where annual interest is paid out of current revenue, but the principal amount is handled through a sinking fund that collects regular deposits from current revenue. These deposits earn interest and the fund is cleared when the debenture bond matures.

Advantages

The regular amortized debenture bond is a standard debt-financing tool that is well established and relatively simple to employ. Regular payments of principal and interest ensure that the debenture will eventually be repaid, and also enable debt capacity to be regained at a steady rate. These bonds are also backed by powers of taxation or the full faith and credit of the municipality. Such debentures are a relatively inexpensive borrowing option.

Disadvantages

The regular amortized debenture bond has a lot to recommend it. As such, the primary downside relates not to the debenture bond itself, but the lack of other borrowing mechanisms that can supplement it. In some ways, Canadian municipalities may be too tied to one form of borrowing.

Winning Conditions and Applications

The regular amortized debenture bond can be used to finance all types of infrastructure, both tax supported and self-supported.

D. POOLED DEBENTURES (Long-Term)

All three orders of government in Canada issue their own bonds, but independent municipal bonds are quite rare except in the large cities. Most municipal debentures are issued indirectly through the province or a provincial-municipal financing authority. Examples of such agencies include the BC Municipal Finance Authority, the Alberta Capital Finance Authority (formerly the Alberta Municipal Financing Corporation), the Ontario Strategic Infrastructure Financing Authority (formerly the Ontario Municipal Economic Infrastructure Financing Authority), the New Brunswick Municipal Capital Borrowing Authority Board, the Nova Scotia Municipal Finance Corporation, and the Newfoundland Municipal Financing Corporation. With pooled borrowing, the

debenture needs across the municipal sector are gathered and the province issues a much larger bond, or series of bonds, in financial capital markets. The proceeds of the bond issue are then distributed to various municipalities. Because these bonds are issued, administered, managed, and guaranteed by the province, most bond rating agencies count them as provincial liabilities and include them in their assessment of a province's credit rating.

Advantages

The concept of pooled borrowing has a long history in Canada. Alberta's municipal finance authority, for example, began operations in 1956. The approach provides two benefits for municipalities. First, pooled borrowing allows municipalities to secure debt-financing at lower rates of interest, primarily through the guarantees offered by the province. Second, pooled borrowing gives municipalities access to the financing expertise of specialists who engage in borrowing on a daily basis. When it comes to municipal debt, establishing a provincial process or agency to facilitate municipal borrowing is a key role to be played by any province.

Disadvantages

Since provinces back these debentures, they have also established municipal debt ceilings and maximum debt servicing levels relative to annual operating or property tax revenues. With pooled borrowing, municipalities have no ability to negotiate interest rates or other terms of the loan. This has led some of the larger cities to strike out on their own and issue their own bonds. Many report they can arrange lower cost financing and better terms themselves. This is particularly the case for those provinces that have had their bond ratings downgraded during the fiscal turmoil of the 1990s.

Winning Conditions and Applications

Pooled borrowing can apply to virtually any infrastructure, but it is still a concept that is more advantageous for smaller municipalities than larger cities. The benefits of pooled borrowing for the larger city are offset by having to take the terms offered by the province.

E. BORROWING AGAINST RESERVES (Long-Term)

A traditional debt-financing tool employed by many Canadian municipalities is to borrow against their own capital reserves and reserve funds. With this tool, municipalities empty a portion of their savings but commit to repaying it, with interest, at some point in the future.

Advantages

Under this scheme a municipality acts as both the borrower and the lender, which provides a certain measure of control unavailable through external debenture bond financing or pooled borrowing. For example, interest rates, amortization terms, and repayment can be locally determined as opposed to being imposed by a third party lender. More important, the interest that is due accrues to the municipality itself. As internal loans are repaid, reserves are replenished.

Disadvantages

The primary disadvantage of internal borrowing is how it releases only a limited amount of funds for debt-financing—the amounts available are restricted to the size of various reserves. As such, internal borrowing does not always relate to a prime advantage of borrowing in general, which is the provision of significant up-front funds for large and expensive capital projects.

Winning Conditions and Applications

Internal borrowing can conceivably finance most forms of infrastructure, but the list of projects will be limited by the size of the reserves. As such, this borrowing is limited in its ability to finance large projects with high up-front costs. Also, many reserve funds are restricted to specific purposes. If borrowing is to come from these funds, the projects financed must be anticipated well in advance.

F. LOCAL IMPROVEMENT OR SPECIAL ASSESSMENT DEBENTURES (Long-Term)

With local improvement debentures, municipalities undertake borrowing on behalf of a limited group of property owners for a specific infrastructure improvement in a certain geographical area. The debentures are funded by a special local improvement levy attached to the general property tax bill.

Advantages

From the municipal perspective, local improvement bonds are an attractive way to debt-finance infrastructure because repayment is not dependent on the general property tax base. Rather, the debt is repaid through special improvement levies imposed at the time the debt is incurred and earmarked specifically for repayment of that debt. Local improvement debentures are a highly effective and efficient form of debt since they draw a direct link between the cost of an infrastructure project and the property owners who benefit.

Disadvantages

At the same time, the scope for local improvement debenture bonds is generally limited. They can only be levied in a small and limited number of geographical areas, and for projects where a direct link can be established to a specific group of property owners.

Winning Conditions and Applications

Local improvement debt is primarily used for repairs and upgrades to existing and highly localized infrastructure, such as sidewalks, street re-paving, water and sewer upgrades, and the refurbishing of community parks. It is not suited to community-wide infrastructure or large and expensive projects.

1.2.2. Innovative Borrowing

A. SHORT-TERM FINANCING

There are relatively few options for innovating with alternative forms of short-term borrowing, but the short-term anticipation note is one exception. Short-term notes are purchased by a wide variety of lenders as opposed to commercial banks or finance companies, and they come in several forms. The tax anticipation note is issued while waiting for an appropriation of specific tax revenue, the revenue anticipation note is issued while waiting for user fee and other revenue, and the bond anticipation note is issued while waiting for voter-approval for a longer-term bond issue or while the bond is still being floated on the capital market. Municipalities also issue grant anticipation notes while waiting for federal and state grants or tax revenue sharing to come through. The capital outlay note is issued in advance of receiving funds appropriated from the municipal capital budget. Most of these short-term notes must be redeemed by the end of the fiscal year in which they were issued.

Advantages

The advantages of short-term notes over standard bank financing are hard to measure, but two possibilities come to mind. First, they expand the available choices for short-term borrowing. Second, they might be able to raise significantly more funds than other traditional forms of short-term borrowing.

Disadvantages

The issuing of a short-term note or long-term bond always involves a set of transaction costs that do not come into play when using a commercial lender or employing a municipal line of credit. Interest rates can also be higher.

Winning Conditions and Applications

Short-term notes can be applied to almost any municipal infrastructure project. In the US, these notes are usually issued in advance of receiving long-term debt-financing or when anticipated pay-as-you-go revenues have yet to materialize. This allows the construction of both debt-financed and pay-as-you-go projects to proceed while the arrangements for longer-term financing are being completed. Thus, short-term notes are generally employed to smooth out difficulties with cash flow and get projects underway. In some instances, short-term notes are also employed as a source of bridge-financing during the construction phase when the sources of longer-term financing are inadequate or the flow of funds has been temporarily disrupted.

B. SMART DEBT

What and how: The idea of smart debt is increasingly dominating the debate over innovative infrastructure finance. Smart debt recognizes that borrowing is a valid form of infrastructure financing, and seeks to facilitate infrastructure investment by growing public and political tolerance for increased levels of tax supported debt. This is accomplished by passing a municipal borrowing policy which sets out very specific and stringent parameters with respect to debt-financed infrastructure.

The idea of smart debt comprises five components. First, smart debt recognizes that not all capital projects are equally well-suited for tax supported debt financing. Appropriate candidates include large projects involving substantial sums and that also provide well-defined benefits to the community. Such projects are one-time or non-recurring in nature, they have long asset lives, and can also leverage additional financing elsewhere. Under a smart debt policy, a list of priority infrastructure projects is developed, and these are then presented as the candidates for which debt-financing will be pursued.

With this approach, governments can earn greater acceptance for increased levels of tax supported debt as a visible link is drawn between the debt being incurred and the infrastructure investment being financed. In the US, tax supported bonds generally need voter-approval before being issued, and many state and local governments have found it easier to secure approval when there is a direct link between a specific project, or a group of projects, and the debt being issued (Yates 2002). The approach is also broadly reflective of the STIP approach employed in the US. For transportation improvements, federal flows only to those state and local government projects that are first placed on the State Transportation Improvement Program or STIP list.

Second, smart debt works out a consensus regarding a sustainable level of borrowing or some notion of optimal debt relative to future operating budgets and anticipated population and economic growth. In other words, smart debt requires cities to work through the subjective question of their tolerance for debt. For example, in February 2002, Calgary implemented a new capital financing policy that allows for up to \$70 million in new tax supported borrowing annually for the next five years. But, strict limits have been set – the cost of servicing all tax supported debt may not exceed 10% of tax supported expenditures. In October of 2002, Edmonton also approved a new debt policy. Total debt charges are not to exceed 10% of city revenues and debt charges for tax supported debt are capped at 6.5% of the tax levy. Debt-financed projects must be worth at least \$10 million, have an asset life of at least 15 years, and must fit into approved capital plans.

Third, smart debt sets out policies regarding amortization periods, which can range anywhere from 5 to 30 years. In Canada, amortization periods tend to run in the 10 to 20 year range, but seldom do they extend past 15 years. This practice is driven by the goal of repaying debt quickly. This results in less interest and the much quicker recovery of debt capacity. But the practice also implies larger annual payments. Most importantly, short amortization terms reduces the amount that can be borrowed. In the past, 25 and 30 year debentures were not uncommon in Canada and they are still in use across the US. Longer amortization allows more borrowing to occur without impacting the costs of debt servicing. In short, the costs of interest should not be the sole factor guiding the choice of an amortization term. Rather, amortization should

be set to match the expected life of the asset. For large projects with very long life spans (50 years or more), an amortization period of 30 years is not unreasonable.

A good example of selecting appropriate amortization terms comes from the City of St. John, New Brunswick. In the 2002/03 budget, the City proposed a significant user fee increase to fund water and sewer improvements. The improvements were to be financed with a 20 year debenture. The local Chamber of Commerce, balking at the magnitude of the rate increase, proposed that the debt term be extended to 30 years, the maximum allowed under provincial legislation. Along with some increased federal cost-sharing, the Chamber argued that the planned user fee increase could be almost halved (Barton 2003).

Fourth, a smart debt policy also speaks to the usage of serial or sinking fund debt, and other debt forms such as structured, retractable, and bullet-style debt. Each structure carries different advantages and disadvantages. With bullet debt, for example, only the interest on outstanding debt is paid for the first half of the term. During the second half, both principal and interest payments are made. While this debt structure carries a higher cost in the end, it can be quite advantageous when confronted with a critical and immediate need but where there is insufficient funding in the near future to service a regularly amortized debenture bond.

Finally, smart debt recognizes that borrowing only finances infrastructure, but the debt itself must be funded. Before issuing debt, cities draw up a comprehensive repayment plan. The earmarking of specific tax revenues can play a role in this regard. The City of Calgary implemented a one-time special property tax levy of 1.7% in 1998, which has been earmarked to fund certain borrowings. The City of Edmonton imposed a 1% property tax increase to help pay for up to \$250 million in new tax supported debt. More recently, the City of Saskatoon has sought approval to earmark a portion of its forthcoming federal fuel tax revenue to repay some debentures it plans to issue in the future.

Advantages

The most significant barrier to increased use of debt is the current mantra of deficit and debt reduction, which makes the option politically difficult. The notion of smart debt helps to work around that opposition by instituting specific policies

and procedures with respect to debt-financing. Given that many Canadian cities have drastically reduced their stock of tax supported debt since the mid-1980s, there is certainly potential to address the infrastructure challenge through borrowing. This point is strengthened by the fact that interest rates are at a 45 year low (Figure 8). For cities that have low to moderate levels of tax supported debt and a relatively healthy balance sheet, there will likely be no better time than now to debt-finance some of their critically needed infrastructure.

Disadvantages

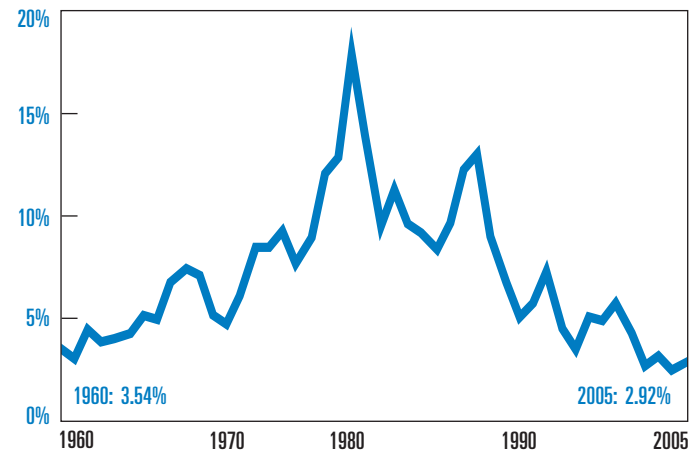
Canada may have only limited capacity to ramp up public borrowing. In the past 10 years, the country has registered impressive gains in lowering the total government debt-to-GDP ratio, which now stands at 72.2% as measured by the OECD. But this is only marginally lower than the 76.3% averaged across all OECD member countries. While over \$40 billion US could be borrowed for infrastructure without pushing Canada over the average, other countries like Australia are in a much better position. With a current gross debt-to-GDP ratio at 17.8% of GDP, Australia could borrow an additional \$370 billion US and still not exceed the OECD average.

Winning Conditions and Applications

The example above underscores an important winning condition for the use of debt-financing in the future. It is incumbent on federal and provincial governments to steer clear of issuing tax supported debt for operating deficits and reserve the nation's expanding debt capacity for its more appropriate use—infrastructure. However, that alone may not be enough. Local governments are also in need of a more robust set of tax levers and/or expanded tax revenue sharing if they are to fund a significant expansion of debt-financing.

A revamped municipal debt policy that incorporates smart debt covers a wide range of municipal infrastructure assets. By mapping out those assets that can and should be financed with debt and setting strict parameters, municipalities can build public support for the increased use of debt-financing. The City of Calgary has approved up to \$350 million in new tax supported debt over the next five years and Edmonton could borrow as much as \$250 million. Vancouver voters recently gave approval to almost \$100 million in new borrowing, and Saskatoon recently issued \$17 million in new tax supported debt as well. In the West, only Winnipeg has appeared to put the brakes on new tax supported debt (Vander Ploeg 2004a).

FIGURE 8: Interest Rates in Canada
(Bank of Canada Rate, 1960-2005)



Source: Statistics Canada Cat. No. 11-210-XPB, the Canadian Economic Observer Cat. No. 11-010-XPB, and Cansim Table 176-0043 (at www.statcan.ca).

C. SENIOR GOVERNMENT CREDIT ENHANCEMENTS

In many countries around the globe, central and regional governments are beginning to partner more intensively with local governments to maximize the use of debt-financing for infrastructure. Credit enhancement has become one such form of cooperation, and is particularly popular south of the border. In the US, several new programs operating out of the US Department of Transportation (USDOT) and the Federal Highway Administration (FHWA) now include several provisions for specific credit enhancements.

In the US, the concept goes back to the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991, which embraced the idea of using federal transportation grants to lever additional local and private sector investment in transportation infrastructure. The idea was expanded under the National Highway System (NHS) Designation Act of 1995 and then firmly entrenched in the Transportation Equity Act for the 21st Century (TEA-21), which provided \$217 billion in new funding for transportation in the US from 1998-2003.. Credit enhancement has been continued under SAFETEA (Safe, Accountable, Flexible, Efficient, Transportation Equity Act), the congressional reauthorization of TEA-21.

Credit enhancement strategies take a number of forms, but they are generally restricted to extending lines of credit, interest rate subsidies, subsidies to offset the costs of bond issuance and insurance, loan guarantees, the provision of senior government

subordinate debt, and direct federal loans to state and local governments (Federal Highway Administration 2004). The idea of credit enhancement and many of the tools to accomplish it are not all that new in the Canadian context. Most provinces already guarantee local government debt and some have also provided grants to subsidize municipal debt-servicing costs when interest rates were high. For example, the province of Alberta implemented several interest rate shielding programs in the early 1980s. Other forms of credit enhancement were also made available under a series of federal infrastructure programs starting in the mid-1990s, and some provinces still provide various credit enhancements through their own provincial capital access programs.

The difference between traditional credit enhancement in Canada and the more innovative approaches used in the US relates to the overall purpose behind credit enhancement. Under TEA-21 and SAFETEA, credit enhancement is specifically designed to drive innovation, primarily by attracting private sector infrastructure financing and converting traditional tax supported transportation infrastructure into user pay infrastructure. The US Federal Highway Administration describes its efforts in this regard by using a pyramid diagram (Figure 9). At the bottom of the pyramid is non-marketable transportation infrastructure. This represents the bulk of most transportation infrastructure. Even with credit assistance, this infrastructure will not attract private financing and must be provided through public borrowing funded by taxation. At the top of the pyramid is marketable transportation infrastructure. This type of transportation infrastructure can be financed privately and funded through user fees without government involvement. Credit assistance is not provided.

In the middle of the pyramid is marginally marketable transportation infrastructure. This infrastructure can be made marketable—but it needs help. In the US, that is where credit enhancement comes into play. State and local governments are encouraged to uncover marginally marketable transportation infrastructure projects and present them to USDOT and the FHWA for rigorous analysis. If the project has a good chance of being made marketable, the federal government negotiates a credit enhancement package with state and local government officials, as well as the relevant private partners. This package can include lines of credit, interest subsidies, bond issuance and insurance

subsidies, and loan guarantees. Washington may also take a subordinate debt position in the project, or even offer a direct loan. The latter two tools are less familiar in Canada, and deserve further exploration.

Many infrastructure projects are marginally marketable only because the anticipated revenues that will be generated by the infrastructure are not large enough relative to the debt incurred to finance the project. User fees will certainly work with this infrastructure, but the revenue coverage is too low. For example, if the user fee revenues generated by a new toll road project are expected to be \$10 million annually but debt service will run at \$9 million, this is considered low coverage. The debt for such a project—unless backed by a guarantee—will not merit an investment grade rating.

In such instances, the debt can be separated into two tranches—a senior tranche and a junior or subordinate tranche. Because the senior tranche has first claim on all debt repayment and it only represents a portion of the total debt outstanding, revenue coverage is increased for the senior tranche. This makes it easier to attract financing and private participation by lowering the risk for the debt holders. When government agrees to assume a subordinate debt position, this can often tip the scales, converting a marginally marketable infrastructure into a self-financing one.

Second, the US federal government also makes direct loans to marginally marketable state and local infrastructure projects. Two types of loans stand out. Under the Transportation Infrastructure Finance and Innovation Act (TIFIA), the USDOT was provided with \$10.6 billion between 1999-2003 to provide direct loans for marginally marketable transportation infrastructure projects. Up to 33% of a project's costs can be financed through a TIFIA loan. The amortization period can run for up to 35 years, during which time the USDOT serves as the patient investor—taking a subordinate debt position with flexibility on loan repayment.

A second type of direct loan—the Section 129 loan—occurs under the US Intermodal Surface Transportation Efficiency Act (ISTEA). Section 129 loans allow US states to loan out their federal highway grants to local governments, local transit and transportation authorities, or a private firm or consortium that is constructing a transportation project that will result in its own dedicated revenue stream. Prior to 1991,

ISTEA restricted such use of federal highway grants. This new opportunity provides states and local governments with a means to recycle federal-aid highway funds by lending them out and collecting repayments from infrastructure project revenues, and then re-using them for other projects.

Advantages

The purpose of credit enhancement is for senior governments to provide a range of financial and non-financial assistance that makes local debenture bond issues more attractive to investors. By providing additional security and increased confidence for the purchasers of municipal debt, local governments can benefit from lower effective interest rate, improved marketability of their debt, and lower overall project financing costs. But innovative credit enhancement does much more. The purpose behind many of the USDOT's credit enhancement programs is to increase the ability of government borrowing to lever additional sources of financing. One such example is to foster private involvement in both the financing and delivery of transportation infrastructure through public-private partnerships (PPPs). Most importantly, credit enhancement has been used as a way to increase the amount of transportation projects that can be financed through user fees as opposed to taxation, thus converting traditional tax supported infrastructure to a user pay system. Credit enhancement is also expected to help facilities get built more quickly and at less cost than under traditional approaches of public procurement and ownership (Kentucky Transportation Center 2001).

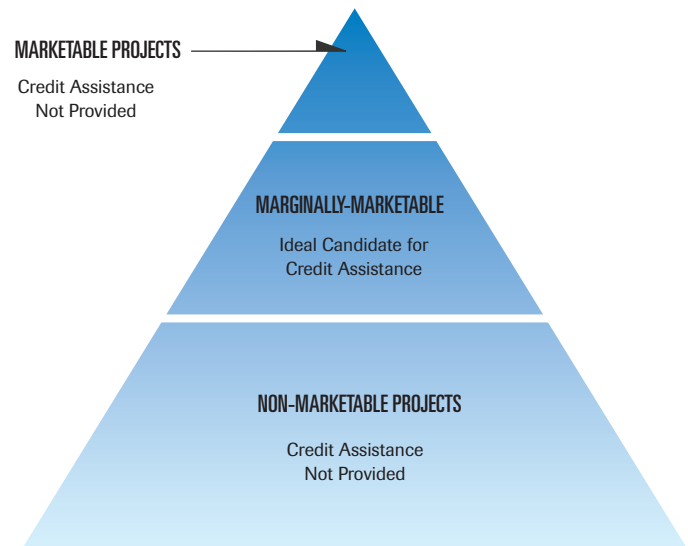
Disadvantages

Credit enhancement in the US has stimulated the borrowing of billions of dollars for necessary infrastructure, and done so in a way that encourages innovation in financing, funding, and delivery. However, the applicability of these approaches to the Canadian scene is made more difficult due to the fact that the federal government is constitutionally restricted in its relationship with municipalities, which remain under provincial jurisdiction. For example, Ottawa cannot issue direct loans to municipalities.

Winning Conditions and Applications

Some US-style credit enhancements may be more difficult to apply in Canada, but they are not impossible. The federal government continues to retain its spending power

FIGURE 9: Credit Enhancement in the US



Source: Adapted from the US Federal Highway Administration *Innovative Finance Primer*.

under the Constitution. This could open the door for an increased federal role in credit enhancement. But the better way ahead probably lies in the negotiation of specific tripartite agreements. This reflects the approach taken with previous federal infrastructure programs, which can serve as a template for implementing various credit enhancement alternatives.

In the US, credit enhancement is largely restricted to transportation and transit infrastructure, which are significant areas of need in both the US and Canada. However, the idea could conceivably be extended to other infrastructure as well. With regards to TIFIA loans, they are available only for specific projects. Eligible projects must be large, stand-alone, incorporate technological innovation, limit environmental impacts, involve significant private participation, and generate their own dedicated revenue stream. Again, the idea is to improve the financial feasibility of projects that are very close to obtaining their own financing in the market, but need assistance. TIFIA loans usually exceed \$100 million, but smaller loans in the \$30 million range can be negotiated if the project will use electronic tolling technology (ETC) or some other type of intelligent transportation system (ITS). Eligible borrowers include state and local governments, transit agencies, independent transportation authorities, and private firms and public-private consortia.

TIFIA loans are used for large scale transportation projects of national or regional importance including major highways and trade corridors, new multi-modal transportation facilities, urban expressways, and public transit. Some of the more well-known TIFIA loans have also involved public-private partnerships (PPPs). Examples include the Miami Intermodal Center, a \$1.3 billion PPP project designed to improve access to and within the Miami International Airport. State Route 125 (SR-125) is a new \$635 million, 9.5 mile toll road in San Diego, privately financed, designed, and constructed through a PPP. TIFIA was also used for the Alameda Corridor, a \$2.4 billion, 20 mile multi-modal transportation corridor connecting Los Angeles and Long Beach. Section 129 loans tend to be much smaller, but they also relate to marginally marketable transportation projects, that can be made to stand-alone. Section 120 loans can stretch to 30 years and repayments can be deferred for up to 5 years after project completion. This helps facilitate stand-alone projects that are dependent on their own revenue to cover the costs of debt-servicing, but where revenues will take some time to materialize after project completion.

D. MUNICIPAL COMMUNITY BONDS

The idea behind the community bond is for municipalities to raise a portion of their infrastructure debt-financing from within the local community as opposed to the more distant and impersonal financial markets or provincial municipal financing authorities. While the process of issuing a community bond is essentially the same as securing a regular debenture bond, it does involve more work on the part of local municipal officials.

Advantages

Community bonds carry a number of unique advantages that cannot be found in other forms of debt-financing. With community bonds, local governments are in control of setting the interest rate, and this rate can usually be set lower than the prevailing bond rate. Community bonds recognize that some citizens value the opportunity to help build their own city, and are willing to forego some interest earnings for the sake of making a contribution. At the same time that community bonds help create a stronger sense of ownership in the community, the municipality benefits from lower borrowing costs. This leads to lower project costs, which can then lead to lower property tax rates (Canada Mortgage

and Housing 1999). Relieving pressure on the tax base allows local businesses to become more competitive (Kitchen 2002b). Most important, the interest paid through a community bond program stays in the local community.

Community bonds are not only beneficial for the municipality—they also benefit citizens by expanding the range of choices for personal investing. While the return on a typical community bond is lower than that of a regular bond issue, returns are usually higher than Guaranteed Investment Certificates (GICs) or Canada Savings Bonds (CSBs). It is also possible for community bonds to be held within self-administered Registered Retirement Savings Plans (RRSPs).

Disadvantages

Community bonds appear to have a lot of upside potential, but there are downsides. Developing a community bond program takes a significant amount of effort on behalf of local officials, who have to advertise, market, and sell the bonds. At the same time, the amount of financing that can be raised is limited to the savings pool within the local community. If this savings pool is relatively small, a community bond program may not be worth the effort.

Winning Conditions and Applications

If a community bond program is to work, provincial involvement is necessary, primarily to secure the bonds. In British Columbia, the BC Municipal Finance Authority recently developed a province-wide community bond program. Under the program, every BC municipality is allowed to issue community bonds, but they are backed by the authority's AAA credit rating as set by Standard & Poor's. The BC Municipal Finance Authority has also worked to smooth the process for municipalities by creating templates and manuals for the community bond program.

Conceivably, community bonds can be used for a wide range of municipal infrastructure, from water and sewer system upgrades to road surfacing projects and new recreational facilities. But one condition applies—projects financed through community bonds will have to possess broad appeal across the community. If the projects selected for community bond financing are not carefully selected, bond issues will fail to sell. Projects also have to be relatively small. While community bonds have been issued in the 5-25 year range, 5 years appears to be the average. As such, community bonds appear to be

more of a short to medium-term financing option as opposed to a more long-term alternative for large infrastructure systems. In the end, the utility of community bonds depends on the extent to which lower borrowing costs can reduce the apprehension of municipalities with the debt-financing of infrastructure. If they do, then community bonds may be a good alternative to consider.

F. MUNICIPAL BONDS (TEBs)

Tax exempt bonds (TEBs) are used extensively throughout the US to finance local infrastructure. Under a bond, the interest earnings to the bondholder are exempted from federal and state income tax, which allows the government issuing a bond to sell it at an interest rate below the prevailing market rate.

Advantages

From a municipal perspective, TEBs provide local governments with greater access to financing at lower rates of interest, which decreases their overall costs. In general, TEBs are politically well received and the take-up rate is quite good. TEBs can also have a strong correlation to specific project developments and general economic investment. While TEBs are a source of lower cost financing for municipalities, from an investor's perspective TEBs are attractive because of the tax advantage and a relatively high degree of security. TEBs are generally seen as predictable, liquid, and offering a good rate of return.

Disadvantages

At the same time, there is considerable debate about the overall merits of bond financing. Some argue that TEBs disproportionately benefit higher-income earners who can afford to invest, and that the overall return in terms of tax savings is greater for the wealthy since they are in a higher tax bracket. In essence, government is subsidizing the bond issuer while transferring wealth from all taxpayers to higher income earners via foregone tax revenues. In short, TEBs are a regressive application of a federal tax subsidy that favours those least in need of tax break—higher income earners.

Further, if only certain cities and towns have the ability to issue TEBs, a similar subsidization effect occurs—people in one area receive the benefits while people in other areas foot the bill (Burleton 2002). Because the entire group of income

taxpayers is subsidizing infrastructure in certain municipalities using TEBs, the link between the tax expenditure and the local infrastructure being financed is broken. Because TEBs provide benefits to one specific group by tapping the entire population for the costs, they suffer from inefficiency and are weak in terms of accountability. Some also argue that the tax subsidy offered through TEBs can artificially increase the role of the public sector (Bech-Hansen 2002).

TEBs also involve a set of transaction fees that have to be paid to brokers and bond traders, which reduces some of the gains that municipalities receive (Mintz 2002). Because of this leakage only about two-thirds of every dollar of tax subsidy actually reaches the municipality in terms of reduced costs, with the rest going to the bondholders (Burleton 2002). In addition, many financial experts suggest that TEBs can generate significant distortions in the bond market by cannibalizing the investor base for other bonds that are taxable (Bech-Hansen 2002).

Winning Conditions and Applications

Several barriers to TEBs in Canada are often mentioned. First, provincial and federal governments would have to amend existing tax legislation and would have to deal with foregone tax revenue (Kitchen 2002b). Second, the market in Canada may not be large enough to support TEBs. The US market for TEBs is likely larger than Canada's because the US has a lower contribution ceiling for tax-protected retirement investments, which frees up more funds for TEBs as a tax-free alternative (Tuck and Bloom 2003). Third, pension funds, RRSP investors, and governments currently hold 65% of municipal debt in Canada, and would likely not invest in TEBs because they cannot realize the tax benefits. This lowers the number of potential investors and could actually force the interest rates of TEBs upwards (Toronto Finance Committee 2000). The issue of pension plan investments in infrastructure has also been raised in the US. Pension plans have little incentive to invest in low interest TEBs because their earnings are already tax exempt. In this case, TEBs work against a broadening of the capital pool for borrowing (United States General Accounting Office 1995).

It is important to note, however, that the many disadvantages of, and barriers to implementing, TEBs are not without their rebuttals. First, the current RRSP program in Canada also creates a clear benefit for higher-income earners, but that is tolerated because of the importance of ensuring adequate

retirement income. The RRSP program also offers the ability to lower future costs by reserving Canada Pension Plan (CPP) payments for lower income seniors as opposed to those with significant investments. Local infrastructure, it can be argued, has a similar importance (Bech-Hansen 2002). Second, the subsidization effects of TEBs could also be offset by significant spillovers in that lower borrowing costs and more and better infrastructure benefits the entire population (Kitchen 2002b). Third, while Canada has higher RRSP limits than the US, the value of a TEB tax break is also higher in Canada because of higher marginal tax rates. Finally, proponents argue that distortions in American bond markets do not appear to be an issue (Bech-Hansen 2002).

In terms of application, it is important to remember that there are two main types of bonds, and each needs to be treated separately. First is the general obligation or GO bond. GO bonds are the plain vanilla of US municipal debt-financing. When issuing a GO bond, local governments pledge the full faith and credit of the government—their powers of taxation—as security for the bond. GO bonds are full recourse bonds secured by the tax base. As such, they are very secure and constitute the least expensive method to borrow, with the interest rate depending on the fiscal health of the government issuing the bond.

In the US, GO bonds typically require voter-approval. Most states have also set limitations on the value of GO bonds that can be outstanding at any one time. GO Bonds come in two variants—self-liquidating (repaid with a dedicated revenue stream generated by the infrastructure that is financed) and non-self liquidating or tax supported (repaid out of general revenue).

GO bonds are best used for infrastructure with a long life span that provides benefits across the community. Typical candidates for tax supported GO bond financing include schools, general purpose buildings, and police and fire stations. Self-financing GO bonds are typically issued to finance municipal water and sewer infrastructure. However, GO bonds do not represent a significant departure from the Canadian practice. Canada's municipalities essentially issue their own variant of US-style GO bonds, in both the tax supported and self-financing variety. The difference is that these bonds do not require voter approval and most self-financing GO bonds are not calculated as part of the debt

ceiling set by the provinces. In the US, both types of GO bonds are typically counted toward state debt limitations (De Alth and Reuben 2005). The main disadvantage of the GO bond is the need for voter approval and increased property taxes and negative bond ratings created by overuse.

The second type of bond is the revenue bond. These bonds, which are non-recourse or limited recourse bonds, are securitized and repaid with a dedicated revenue stream generated by the infrastructure itself. When issuing a revenue bond, a municipality does not pledge the full faith and credit of the municipality to secure the bond. Rather, the security or collateral for the bond is the future stream of revenues that the infrastructure project will generate, whether that be user fees for a water project, special assessments or local improvement levies, or future tolls for a new toll road. The credit quality of a revenue bond depends on the financial strength of the project.

In the US context, revenue bonds carry a number of advantages. First, they do not require voter approval and are not generally counted toward state legislated debt limits. As such, they are easier to use politically. Second, because these bonds are issued with anticipated future revenues as the security, they must meet an objective market test for commercial viability. This promotes the full-cost pricing of the infrastructure that is being financed, and makes them more efficient than the traditional GO bond. Third, revenue bonds shift some of the risk of financing to the bondholders, but they do so without incurring loss of ownership or control over the infrastructure (Burleton 2002). This may be preferable to going with a full public-private partnership (PPP) model, which transfers risks to the private sector but can result in a loss of ownership privileges. Finally, revenue bonds do not affect credit ratings (Brittain 2002).

The primary disadvantage of revenue bonds is merely the flip-side of the advantages. Because revenue bonds are backed up by anticipated revenues that will be produced from the infrastructure itself, the bonds involve a certain measure of revenue risk in the event that the anticipated revenues do not materialize. To compensate the bondholders for this risk, revenue bonds carry a higher interest rate.

Revenue bonds are typically employed as a tool to finance independent and one-off infrastructure projects. They are a specific mechanism employed for project-based financing

where the bondholders are satisfied with non-recourse credit. Revenue bonds are typically used for stand-alone infrastructure projects that are marketable and can survive on their own cash flow, whether that be user fees or tolls. To mitigate against excessively higher rates of interest, the projects financed with revenue bonds need to prove themselves capable of producing an adequate and predictable stream of revenues because the cost of such financing depends on the risks involved with the project and the degree of profitability expected (De Alth and Reuben 2005).

Revenue bonds can be employed as part of a public-private partnership (PPP) but they can also be used as an alternative to the PPP approach. PPPs essentially transfer a number of risks to the private sector (e.g., construction risks, operating risks, etc.). With revenue bonds, only some of the financing and revenue risks are transferred, with the rights of ownership remaining firmly within the public sector.

Like GO bonds, revenue bonds come in a number of different forms. Many of the variants carry a different label simply based on how the bond income is generated, how the bond is paid out, or the specific purpose for which the bond has been issued. For example, zero-coupon-bonds pay no interest. These bonds are sold at a discount and then redeemed at par upon maturity. Because no regular interest payments are made, the costs of financing are incurred only at the end of the bond term. Zero-coupon bonds allow municipalities to gain access to funds without incurring immediate funding pressures. A typical use of a zero-coupon bond is for construction finance. The interest and principal are deferred throughout the construction period or until the infrastructure is up and running and generating its own revenues. Zero-coupon bonds can be a helpful cash management mechanism (Brittain 2002).

Real return bonds see the interest charged over the life of the bond adjusted for inflation so that the final return will match any increase in prices. Real return bonds do not have a fixed payout, they are not very liquid, and their tax status is complicated. Yet under certain circumstances, they can be more marketable than the regular revenue bond (Canadian Union of Public Employees 2004a and 2004b).

In the US, TEBs can also be issued by private sector firms and consortia engaged in a PPP project. These bonds take the form of the private-activity-revenue-bond. Expanding the use of TEBs to the private sector is seen as a way of encouraging state and local governments to enter into various public-private partnerships (Capka 2005). Other types of revenue bonds include TIF-backed revenue bonds and redevelopment-revenue-bonds. In California, local governments often set up special community financing districts (CFDs), community development districts (CDDs), and community development authorities (CDAs) to provide infrastructure in specific areas. These districts can issue their own Mello-Roos revenue bonds, which are secured by a special tax levied upon properties within the area. Mello-Roos bonds are issued under the Mello-Roos Community Facilities Act of 1982, and are unique to California. Other revenue bonds relate specifically to municipal leasing, municipal lease-purchase-financing, and various leaseback arrangements. These types of bonds include lease-purchase bonds, lease-payback bonds, public-lease-revenue-bonds, leaseback-financing bonds, and certificates of participation (COPs). These bonds do not count toward local government debt limits as they are seen as a short-term rental obligation rather than a long-term debt obligation.

An interesting type of bond is the Qualified-Zone Academy Bond—a bond on steroids. The bond pays no interest at all, but the bondholder receives a federal tax credit in lieu of interest. These bonds are a US invention to help finance the reconstruction of schools in urban areas with very high rates of poverty. The bonds are highly regulated, yet 46 states (and the District of Columbia) have the authority to issue them. To date, the results have been disappointing and uptake has been limited.

The variety of municipal bonds available in the US is unique, and is largely the result of having to find innovative ways to get around voter reluctance in approving GO bonds and the various tax and expenditure limits (TEs) that have been passed in more than a few states. In the late 1970s and 1980s, a number of states passed constitutional amendments or legislation to restrict property tax increases and cap municipal operating and capital spending to the rate of inflation. In California, this goes a long way in explaining innovations like Mello-Roos bonds, special community financing districts, and lease-purchase-financing bonds—all of which flowed out of Proposition 13,

which was passed in 1978. Between 1987 and 1996, lease-purchase-financing bonds issued by counties in California increased 563%. Over the same period, the usage of GO bonds declined by 36%. State and local governments in the US are increasingly turning to these types of bonds to avoid the difficulties of securing voter approval (California Budget Project 1999). In short, the variety of municipal bonds in the US is a direct policy response to various financing and funding obstacles that have made it difficult for local governments to invest in local infrastructure.

In the mid-1990s, Australia decided to follow the US approach and introduced legislation providing for bonds—Australia Bonds. These TEBs apply only to a specified list of eligible infrastructure including land transportation, roads, rail, airports, seaports, electrical generation, transmission, and distribution, gas pipelines, water supply, and wastewater installations (Price Waterhouse 1996). In 2003, Ontario became the first Canadian province to allow municipalities to issue its own bonds. These bonds—called Opportunity Bonds—are exempt from provincial income taxation only.

It is not clear how the wide variety of bonding alternatives relates to the Canadian experience. Would Canadian municipalities borrow more if they had access to bonds? In the final analysis, the merits of bonds are generally clear, but the decision to go that route does involve some significant trade-offs, particularly with respect to questions of equity and the larger impacts on the domestic bond market. In the US, those trade-offs are obviously perceived as weighing in favour of TEBs.

Establishing, regulating, and enforcing a US-style municipal bond system would involve significant costs. Some analysts argue that TEBs do not offer many offsetting advantages over local borrowing that can be piggy-backed off state or provincial borrowing (Allen Consulting Group 2003). Others argue that simply offering an interest rate subsidy through a direct grant may be a better and more efficient way to proceed (Burlleton 2002). The debate over this financing instrument is a relatively recent addition to the larger debate over urban finance questions in general. In time, Canadians may be able to better assess TEBs given Ontario's recent decision. Then a stronger and more clear consensus on the value of TEBs may emerge.

F. BOND BANKS

In the US, state-run bond banks provide counties and municipalities with access to the domestic bond market through state-issued securities. Typically, state bond banks bolster the borrowings with some type of credit enhancement, usually a subsidized rate of interest. Bond banks tend to operate as independent self-supporting authorities, although some states do subsidize them.

Advantages

The advantage of a bond bank primarily flows to smaller communities that cannot secure their own bond rating, have limited access to bond markets, or for whom the costs of borrowing on their own is prohibitive. The main advantage relates to accessing debt at a reasonable cost.

Disadvantages

Bond banks reflect the current Canadian practice with provincial-municipal financing authorities. The only difference is the services they offer, such as various credit enhancements, and the degree of independent autonomy they might possess.

Winning Conditions and Applications

Bond banks are used to finance a wide range of infrastructure—from water and wastewater systems to schools, transportation, and solid waste.

G. REVOLVING LOAN FUNDS

Revolving loan funds pool financial capital using federal and state or provincial funds, and local governments then borrow from the pool to debt-finance infrastructure. Revolving loan funds are a form of intergovernmental borrowing, and have been a long-standing source of debt-financing for state and local infrastructure in the US as well as the European Union (EU). For example, the European Regional Development Fund (ERDF) has an allotment of \$260 billion over 7 years making it one-third of the entire EU budget.

Advantages

The permanency of a revolving loan fund is its single largest advantage. In the US, state revolving loan funds (SRFs) are continually recapitalized with annual federal grants and state matching funds. Because all the loans are repaid with interest, this multiplies the benefit of the original grant and

creates a stable, reliable, and perpetually growing source of financial capital. In most states, SRFs also provide subsidized interest rates and other credit enhancements which result in a lower cost of borrowing. Another advantage from a local government point of view is the fact that revolving loan funds are administered at the state level. This has helped create a level of flexibility. States and local governments have been able to tailor their own revolving loan fund programs by determining local priorities, customizing loan terms, and establishing project eligibility. Resources can also be targeted to where they are needed most.

Disadvantages

Over the years, US state revolving loan funds have shown a number of weaknesses—some are more general in nature while others are related to current administration practices. First, federal-aid granting amounts are dependent on congressional approval, and they have not always been maintained at a consistent level. As a result, the demand for SRF loans continually exceeds capacity. Second, a growing area of concern with SRFs is the fact that loans are available only to public agencies, yet there is an increasing trend in the US to provide infrastructure through various public-private partnerships. Third, the SRF system seems more applicable to smaller municipalities than larger cities. In 2001, 65% of all SRF loans in the US were made to municipalities with populations under 10,000.

Winning Conditions and Applications

The type of infrastructure financed through SRFs in the US is limited, and this restricts their usefulness as a financing tool. In the US, the revolving loan concept traces its beginnings to the creation of the Environmental Protection Agency in 1970 and the Safe Drinking Water Act of 1974. Rising concern over water quality issues associated with the discharge from publicly-owned wastewater treatment plants and storm drainage eventually led to a new Federal Clean Water Act in 1987. This act established State Revolving Funds (SRFs) as a way to encourage local governments to invest in water and wastewater infrastructure upgrades. Under the act, state revolving funds were created with federal grants matched with a 20% contribution by the states. The revolving loan funds then provided low interest loans to local governments for the construction of water and wastewater treatment plants. The Safe Drinking Water Act Amendment of 1996 developed

the SRF idea further. Today, most US federal grants for water and wastewater infrastructure are used to grow revolving funds at the state level.

As a result, SRFs in the US are primarily limited to water and wastewater infrastructure, storm drainage, and flood control. While some SRF-based loans have been used to finance airport facilities and transit, these are exceptions rather than the rule. This limited focus may be one of the biggest problems with state revolving funds as currently employed. Municipal water, wastewater, and storm drainage infrastructure has proven itself to be quite marketable, and the practice of using tax dollars to subsidize such systems does little to promote efficiency in infrastructure delivery.

H. INFRASTRUCTURE BANKS

Infrastructure banks are a special type of revolving loan fund specifically dedicated to financing surface transportation in the US (e.g., roads, public transit, bridges, freight rail, purchases of right of way, new street construction, and repair of existing roadways). Infrastructure banks and revolving loan funds are close cousins in terms of how they operate. The idea for state infrastructure banks (SIBs) goes back to a series of amendments made to the National Highway System (NHS) Designation Act in 1995. Prior to those amendments, states were not allowed to capitalize federal-aid funds for transportation into a revolving fund, even though they could do so with federal grants for water and wastewater infrastructure.

In 1995, the USDOT was given authority to establish a SIB pilot program for transportation in 10 states (Arizona, California, Florida, Missouri, Ohio, Oklahoma, Oregon, South Carolina, Texas, and Virginia). The pilot program allowed these states to use up to 10% of their federal-aid grants for transportation to capitalize an infrastructure bank. Similar to the revolving loan fund, states had to match the capitalized federal grants with a 20% matching contribution. The pilot program proved successful, and the new 1997 USDOT Appropriations Act expanded the program significantly. Today, 38 US states have created their own state infrastructure banks using federal grants for transportation. Some states chose to contribute more than the required 20% contribution in order to increase the potential and effectiveness of their infrastructure banks.

Advantages

Like all revolving funds, the recycling of interest and principal repayments creates a perpetual and growing source of financial capital. In turn, this allows more capital projects to be financed than can be accomplished through a direct pay-as-you-go grant or subsidy. But SIBs also incorporate a number of unique differences over the standard revolving fund. Not only do SIBs offer a wider range of loan types and credit enhancements, there are very few federal conditions that attach to individual loans—each SIB has considerable flexibility in structuring its own loan agreements. Like most state revolving funds, SIBs also offer low interest loans, but these are guaranteed by the deposits in the SIB rather than the credit of the state, county, or municipality.

SIB loans also incorporate flexible repayment terms. For example, principal repayments can be deferred for projects that will result in a new stream of revenue at a later date. Other interest-free loans can also be arranged during the construction period, or the interest can be capitalized into the overall project cost. SIBs can also take a subordinate debt position in an infrastructure project. SIBs offer bridge financing and other short-term construction loans to maintain liquidity if a project runs over budget.

Most importantly, SIB loans are not just made to state and local governments and their related agencies and authorities, but to private firms and public-private consortia as well. Thus, SIBs have enhanced private sector investment and involvement in the development of transportation infrastructure through public-private partnerships. SIBs accomplish this by lowering the financial risks of transportation projects and thereby attracting the interest of private sector partners. As such, SIBs represent a refinement to the regular state revolving fund.

A look at the Ohio State Infrastructure Bank sharpens the point. The Ohio SIB can make infrastructure loans to any public entity or private and non-profit entity with a government sponsor. Eligible projects include highways, public transit, or any other project qualifying for federal funds, including aviation infrastructure and intermodal facilities. The interest rate is typically three-quarters of the state prime rate and the maximum term is 25 years. Collateral for the loan can include a pledge of future revenues, guarantees from the borrowers, a first lien on assets, and any equity investment. Loan payments can be deferred or ramped up, and interest costs can be capitalized into the cost of construction.

Disadvantages

The unique character of state infrastructure banks means they do not carry many of the disadvantages that apply to the typical state revolving fund. This, combined with their popularity south of the border and the growing amount of funds they have loaned, has drawn the attention of infrastructure providers and municipal financial analysts. Between 1995 and 2001, SIBs had only provided \$765 million in loans. Since 2001, however, that amount has grown well into the billions. Yet despite all the attention they garner, it is important to note that 91% of all funds loaned through SIBs have occurred in only 6 of the 50 US states—South Carolina, Florida, Arizona, Ohio, Texas, and Missouri. The uptake in the other 44 states has been less impressive.

While the reasons for this are not entirely clear, it could be that many US state and local governments are simply not that excited about substituting direct federal pay-as-you-go granting assistance for access to low-interest debt-financing. From a political perspective, transferring a lump sum grant provides more recognition than setting up a bank, and as already discussed, many state and local governments can encounter difficulties when engaging in borrowing. Creating infrastructure banks also requires more than an initial grant, it also involves other set-up costs, a certain amount of financial and managerial expertise, as well as market credibility and public support. Some of these factors may have worked against designing vibrant state infrastructure banks in many US states.

Winning Conditions and Applications

Some of the differences among the various states may also centre around the different types of state infrastructure banks in play across the US. SIBs come in one of two forms. An unleveraged SIB lends out only the funds currently on deposit. This approach reflects a revolving loan fund proper and results in only a limited amount of money that can be loaned at any one time. While the loans are recycled, there can be a long lead time before the SIB is replenished and more loans can be drawn. To maximize replenishment of unleveraged SIBs, some states have limited borrowing to short-term loans only. Obviously, this limits the potential of the SIB as a debt-financing instrument.

The other type is the leveraged SIB, which more properly functions like a bank. Leveraged SIBs issue bonds against

their initial capitalization, much like the fractional banking process. This dramatically increases the amount of funds that can be loaned. Rather than loaning out the funds in the SIB, the funds are pledged as security for a larger bond issue. The state of South Carolina offers the most dynamic example of a large leveraged state infrastructure bank. Since its inception in 1995, that state's infrastructure bank has approved over \$3 billion in state and local infrastructure financing. The SIB has issued over \$1.2 billion in revenue bonds, and expects to issue another \$4.8 billion in the future. The financing arranged through the state infrastructure bank has helped condense the waiting list of projects from a timetable of almost 30 years into 7 years.

In the US, SIBs are used almost exclusively for surface transportation infrastructure, and many focus on projects that will result in the creation of a new revenue source. In the US, SIBs have become a popular tool for helping to make marginally marketable infrastructure projects marketable. Examples include the development of new toll roads. Typical loans have ranged between \$250,000 and up to \$20 million, although there are no statutory minimums. Amortization terms can stretch out to 30 years. As a revolving fund, infrastructure banks provide loans to both state and local government transportation projects.

Pockets of success with SIBs in the US have prompted calls for a national infrastructure bank and an extension of the types of projects that can be financed with SIB-based funds. This goes back to 1984 when the Advisory Commission on Intergovernmental Relations, which studied the financing of public infrastructure, recommended the creation of a National Reconstruction Finance Corporation, a type of national development bank (Advisory Commission on Intergovernmental Relations 1984). The Canadian Union of Public Employees (CUPE) has made a similar argument for a national dedicated infrastructure revolving fund, bond bank, or infrastructure bank in Canada.

In the absence of a more detailed analysis, the prospect of a Canadian national infrastructure bank or a series of provincially-administered infrastructure banks is quite appealing. This is particularly the case if the bank can build in incentives to finance, fund, and deliver infrastructure in more innovative ways—whether encouraging the use of user pay infrastructure systems, helping turn marginally

marketable infrastructure into marketable infrastructure, or leveraging public-private partnerships. Recent budget surpluses at the federal level could very well seed such an effort. Canadian governments have not had much experience with infrastructure revolving loan funds (Irwin and Carpenter 2005). However, the Green Municipal Investment Fund, announced in 2000 as part of a renewed federal infrastructure program and seeded with \$100 million in federal funds may serve as a template.

To create a national infrastructure bank, legislative amendments will be required along with provincial approval and municipal participation. If a bank is to succeed, municipalities would also have to overcome any hesitation to borrow. Because of these barriers, some have suggested that an infrastructure bank be established with federal and provincial funds that would then issue interest free loans requiring only the repayment of principal. This would certainly reduce municipal adversity to debt financing, and it would also reorganize grant funding so that it is gradually diminished over time rather than spent in one lump sum on a pay-as-you-go basis. The worry, of course, is that capital markets could become distorted. The ability of the bank to issue debt on its own behalf would also be compromised as its financial assets and future revenues are continually reduced. The only way to avoid this outcome is to continually capitalize the bank with more grants.

H. PRIVATE AND PUBLIC PENSION PLAN CAPITAL

Another innovation in the debt-financing of infrastructure involves increased participation of public and private pension plans as a source of financial capital. In 2000, there was almost \$600 billion in pension fund assets under management in Canada. In 2003, the top 100 funds in Canada had a market value of \$475 billion, and by 2013, the value of the Canada Pension Plan (CPP) alone is expected to be \$160 billion (Canadian Union of Public Employees 2004a). While more than a few managers of Canada's public and private pension plans have expressed interest in infrastructure, they have also lamented the lack of opportunities. For example, Lee Fullerton of the Ontario Teachers' Pension Plan noted that the fund has some \$85 billion in assets, but they have been frustrated by the lack of infrastructure opportunities.

Advantages

In many ways, pension funds and public infrastructure are a good fit. Infrastructure requires substantial funds over a long-term investment horizon. This suits pension plans well since benefits are not paid out for 20, 30, and even 40 years. Some funds also report that the range of choices for stable investments is dwindling. This opens the door for public infrastructure, which is relatively stable. For example, real estate has always been a good performer for pension funds. But some funds, like the Ontario Municipal Employee Retirement System (OMERS), have said they are close to exhausting their real estate options. Pension funds are also beginning to follow economically targeted investment approaches—selecting under-funded projects based on other criteria in addition to the rate of return, such as increased employment or environmental benefits. Based on these criteria, infrastructure is a good candidate.

Disadvantages

Pension plans have a fiduciary responsibility to seek out the highest risk-adjusted rate of return for their participants. Infrastructure investments do not always provide the best rate of return even though they can contribute to diversification within pension plan portfolios. In addition, liquidity and a certain amount of standardization among investments are also important to pension funds but infrastructure projects does not always possess these characteristics.

Winning Conditions and Applications

The whole point of pension fund involvement is moot if the municipal sector in Canada continues to express deep reservations about borrowing to finance infrastructure. Pension funds speak to the establishment of a capital pool to borrow against, with comparable rates of interest earned, to meet the fiduciary interests of their members. The same applies with bond banks, revolving loan funds, and infrastructure banks. However, the issue with debt-financing is not so much expanding the size of the domestic capital pool from which borrowings can be undertaken. Rather, it is the unwillingness or inability of municipalities to borrow. For pension plans to offer anything in infrastructure finance, that reluctance must be addressed first.

The 1995 GAO report concluded that pension plans will likely have to identify certain niches—specific infrastructure projects—into which their capital can be invested. Such projects

are generally limited to stand-alone user pay infrastructure that has an identifiable revenue stream and also exhibits adequate market demand (e.g., new toll roads). While there is also potential in terms of public-private partnership ventures, that area is complicated by the opposition expressed by many public unions to the PPP approach. In the end, the GAO study stated that the goal of attracting pension fund capital to infrastructure is problematic and unless niches can be found, the future role of pension plans in infrastructure will not be significant.

J. ASSET-BACKED BORROWING

With asset-backed borrowing, municipalities do not borrow against their powers of taxation (a general obligation bond) or even the anticipated future revenue from an infrastructure project (a revenue bond). Rather, the current value of existing assets serves as the collateral for the bond.

Advantages

Asset-backed debt is one of the most rapidly growing instruments in world capital markets, and they are a lower cost option than the standard revenue bond. Cities in Canada, however, cannot generally borrow against assets (Burleton 2002).

Disadvantages

Asset-backed debt is only relevant for certain infrastructure, particularly marketable assets that can be self-financing. They appear to be more relevant for larger cities.

Winning Conditions and Applications

With asset-backed debt, the current value of existing assets serves as the collateral for borrowings undertaken to rehabilitate or reconstruct infrastructure. Asset-backed borrowing thus provides municipalities with a debt option for redevelopment purposes. Asset-backed borrowing can also be used to construct new infrastructure, with the value of the asset put up as collateral for the debt. In the US, asset-backed debt has proven quite useful in financing sports stadiums, often as part of a public-private partnership. Traditionally, such financing was issued in the municipal markets and secured by taxes, but that is changing. Recent transactions employing variants of asset-backed borrowing include the new Pepsi Center in Denver, the American Airlines Arena in Miami, and a re-financing of the America West Arena in Phoenix.

SUMMARY OF BORROWING

Borrowing has always been an important source of financing for infrastructure. It is particularly helpful for large assets with large up-front costs and long life spans. But for the past 20 years, many Canadian municipalities have put the brakes on borrowing and tilted their capital budgets toward a very conservative pay-as-you-go approach. Across the world of infrastructure finance, a number of options exist to expand the opportunities for borrowing. At a minimum, municipal debt policies can be revamped using smart debt as a guide. More aggressive approaches include expanded opportunities for credit enhancement and community bonds. Establishing infrastructure revolving funds and infrastructure banks are yet another way forward. However, the matter of borrowing cannot be divorced from the wider issue of funding. If debt-financing is to be at all effective, the issue of funding must also be addressed.

2. Funding Tools

Canadian cities have not taken advantage of general obligation borrowing nearly to the same extent as their US counterparts, leaving considerable scope for them to address many of their infrastructure financing challenges through this lower-cost tool. This relative aversion to debt could reflect a number of factors, including an over-reliance on the slow-growing property tax.

—Derek Burleton (Burleton 2004)

Governments can also improve the prospects for local tax mobilization by assigning more buoyant, less politically sensitive taxes to local government ... In assigning taxes to local governments, central governments must strike a balance between the economic virtues of the property tax, and the more promising revenue prospects of other less direct forms of taxation.

—Bill Dillinger (Estache 1995)

2.1. Taxation

When confronted with the choice of funding public infrastructure, governments can either choose taxation or user fees. In some instances, both can be employed. Taxation is the most common form of centralized funding. With a tax, governments charge individuals and business, under force of law, a compulsory levy on income, consumption, or wealth. This revenue is then centralized (i.e., deposited into a general

revenue fund). Withdrawals from the fund cover a wide swath of public operating and capital expenditures. In the case of municipal infrastructure, taxation revenue accrues from the direct imposition of a tax or is received indirectly through intergovernmental grants and tax revenue sharing.

Advantages

The key advantage of the taxation approach is the relative ease with which it can be employed. The tax and spend method involves very little effort compared to establishing a system of user fees. Taxation avoids the headache of analyzing individual infrastructure and services, tracking expenditures, and bothering with activity-based accounting or the cost-pricing of various activities. Taxation is also a broad-based funding source—relatively small increases can generate large amounts of revenue. Taxation also works for a wide range of infrastructure. Most importantly, taxation is a good way to ensure universal access. Whenever infrastructure and services are funded through taxation, they are made available to all regardless of income level or socio-economic status.

Disadvantages

All taxes result in some distortion within the broader economy and produce a certain amount of deadweight loss that lowers the potential for enhanced productivity and economic growth. While some taxes are worse than others, the overall effects are well-known and need not concern us here. From an infrastructure point of view, the primary disadvantage of centralized tax funding is simply the lack of financial consequences that accrue directly to individuals (Palda 1998). In other words, taxation does not establish a direct link between those who pay for the infrastructure and those who benefit. Because the costs are shared irrespective of usage, there is no financial incentive to reduce individual consumption of infrastructure and services. This leads to higher total costs for government and artificially increased demands for more infrastructure and services (Groot 1995). Centralized financing through taxation is less efficient than user pay and can also lead to perverse economic effects, including cross-subsidization that redistributes incomes in unintended ways. While the provision of infrastructure and services through taxation has often been defended as a way to indirectly redistribute incomes from higher income individuals to lower income individuals, there are also instances in the municipal context where the opposite occurs (Vander Ploeg 2004a).

Winning Conditions and Applications

The ongoing discussion over innovative infrastructure finance has led to a fairly strong consensus in the policy community regarding taxation as a funding source. This consensus recognizes that certain public infrastructure and services cannot be financed aside from some form of public tax expenditure. At the same time, the consensus urges governments to avoid the mistake of assuming that taxation is the only viable approach—governments need to begin distinguishing between non-marketable and marketable infrastructure. They also need to understand that the line separating the two is continually shifting—what used to be non-marketable yesterday can be quite marketable today. For example, new advances in digital processing technology and advanced Global Positioning Systems (GPS) are continually merging with new—and admittedly complex—public and private financing tools to push the envelope.

In short, taxation should be reserved as the funding choice of last resort. Governments should submit their infrastructure assets to a stringent test for marketability. If an infrastructure system is marketable or even marginally marketable, then options and alternatives that result in complete user pay funding should be pursued, with partial user pay and tax-based funding serving as the second best alternative. With marketable infrastructure assets, enough individuals are more than willing to pay a user fee because they will draw a measure of private benefit from the infrastructure that exceeds the fee they are required to pay. This amounts to economic development and growth—a new infrastructure service is provided that is self-funding and provides a positive net return on the original investment. Whenever governments construct a new marketable infrastructure system that is self-funding with user fees, or rehabilitate an existing infrastructure system and convert it to user pay, the total amount of funding available for infrastructure is increased and scarce tax dollars are reserved for other forms of infrastructure that cannot be funded through a fee-based approach.

When it comes to the choice of tax-based funding or user fees, marketability and non-marketability is the key characteristic. As a funding source, taxation should be exclusively reserved for infrastructure assets with proven non-marketability. If an infrastructure is marginally marketable, governments should pursue alternatives that push the infrastructure into the marketable category. As already noted, this is one of the

primary objectives behind many state infrastructure banks south of the border and the various credit enhancements offered by the US Federal Highway Administration (FHWA) and the US Department of Transportation (USDOT) under the Intermodal Surface Transportation Efficiency Act (1991 ISTEA), the National Highway System Designation Act (1995 NHS), the Transportation Equity Act for the 21st Century (1998-2003 TEA-21), and its successor, SAFETEA. As a second option, a combination of partial taxation and partial user fee funding can also be considered.

General obligation bond financing (tax supported debt) coupled with tax-based funding has traditionally been viewed as the best way to spread out the inherent risks associated with infrastructure development, even if user pay funding and revenue bond financing could theoretically be employed. This assumption carries particular weight when considering large and complex infrastructure with high up-front costs, long construction and payback periods, and where the future revenue commitments were either substantial or relatively unclear.

However, it should be noted that taxation does not really manage, mitigate, or remove risk—taxation can only dilute the risk. The ease with which risk is diluted across the public sector means that governments are in a relatively weak position to effectively manage it. Some analysts conclude that this has had the effect of increasing the total cost of public infrastructure right across the board. Innovative infrastructure finance concludes that there is still a role for taxation to play with respect to risk, but it should not be considered as the first or even the most optimal choice. Around the world, infrastructure providers continue to experiment with various public-private partnership (PPP) arrangements that offer new ways of shifting risk between the public and private sector to reduce the threat of system failures, cost over-runs, and revenue shortfalls.

Tax-based funding—just like pay-as-you-go financing—is limited. This scarcity relative to user fees means tax-based funding should be applied carefully and only where it is absolutely needed. Although there are always exceptions to the broader rule, tax-based funding is best suited for soft social infrastructure as opposed to hard economic infrastructure. Soft infrastructure tends to involve income redistributive purposes that may not fit with a strict user pay approach.

The issue of usage is also important. Taxation is better suited to those assets that will be used proportionately more by those with lower incomes. Taxation is often the only choice when governments are confronted with a highly integrated system, but there may be a way to carve off certain components and fund them through user fees as a stand-alone asset. An example of this approach are new tollways or toll-lanes that run parallel to the tax-funded freeway. Modest increases in property taxation are more likely to succeed when it concerns new infrastructure that has both a high priority and high visibility. However, those characteristics should not be allowed to drive the final decision on whether or not taxation should be used.

2.1.1. Traditional Taxation

A. PROPERTY TAX REVENUE

General property taxes derive revenue from a levy on the assessed value of real property, including land and improvements. In administering the tax, properties are split into various classes (e.g., residential, commercial, industrial) and those classes are further broken down into categories (e.g., multi-family residential, single-family residential). Each class and category of property is then taxed at a certain rate relative to the assessed value of the property. The property tax rate (or mill rate) often varies between different classes and categories of property.

While the general property tax constitutes the single largest source of tax-based infrastructure funding for municipalities in Canada, it is not the only property tax open to them. For example, some municipalities impose a special or supplemental business property tax. Under this tax, business properties are assessed on the amount of rent that the property could yield as opposed to the value of the property itself. Other forms of property tax are also possible—but they tend to be a mixed bag. These include levies that simply flow through the city to regional governing authorities or quasi-independent entities like local business revitalization zones or library boards. In the past, some municipalities could also levy taxes on other forms of personal property aside from real property. All of these taxes are largely irrelevant from an infrastructure funding perspective in that they are generally used for operating budget purposes or are dedicated for specific uses. However, to the extent that they help cover operating expenses, this does free up additional general property tax revenue that can be transferred to the capital budget.

Advantages

As a funding mechanism, property taxes have a number of advantages. Property taxes are a dedicated local tax and the rates are locally determined. Depending on how the tax is administered and applied, it also provides a good fit with the benefits principle of taxation—those who benefit from the tax also pay the tax. The tax is also visible and transparent, which ensures a high degree of accountability. Most importantly, the base of the tax—land and improvements—is relatively immobile and stable. This produces high levels of compliance and stable and predictable flows of tax revenue.

Disadvantages

However, the property tax also has its limitations. The historical appeal of the property tax as a local tax is weakening, particularly considering increasingly complex assessment practices and the provincial take-over of the education portion of the tax in some provinces. Municipalities do not have unfettered freedom with the property tax—many provinces are quite involved in matters of assessment and other decisions on how the tax is administered. Unlike other taxes, there is no completely objective measure of the property tax base, which is arrived at through a process of assessment that is open to dispute. In some municipalities, it is not unheard of to have up to 10% of the commercial assessment base under challenge at any given time. Because the property tax is based on wealth as opposed to income or consumption, the tax is not always related to ability to pay. As a wealth tax, the property tax also targets capital investment, the very fuel driving economic growth, innovation, and increased productivity. Some economists argue that capital taxes are among the worst taxes possible (Clemens, Emes, and Scott 2002).

When it comes to funding infrastructure, the property tax presents three challenges. First, infrastructure for new development is often needed before property tax revenues are generated from the development. Second, the benefits principle does not always apply. Property values do not always relate to an individual's use of certain services and infrastructure. This is particularly important when considering large cities. Because the reach of these cities extends across a much larger region, they must provide infrastructure to meet the needs of a much wider community (e.g., commuters, truckers, tourists, business travellers) who pay their residential property taxes elsewhere but who nonetheless impose a

significant load on the local infrastructure. Third, while the tax base is immobile and stable, that also means the tax is relatively inelastic leading to sluggish growth in revenues. This lack of growth limits the ability of local governments to use the property tax as a funding source to debt-finance infrastructure. Only when tax revenues expand at a reasonable pace can some of that growth be leveraged with modest increases in debt without burdening the operating budget. These considerations have prompted many to conclude that the property tax is inherently flawed as a source of funding for the growing infrastructure needs of cities (Burleton 2002). It is also the primary reason why governments are looking for alternative funding options (Allen Consulting Group 2003).

Winning Conditions and Applications

Because they are the only substantial tax available to municipalities, property taxes are used wherever and whenever municipalities need a tax-based funding source. This applies even if the tax is not particularly well suited for the specific infrastructure in view. Most analysts concede that the property tax is a good fit for providing a wide variety of hard economic infrastructure that benefits specific properties (e.g., roads, sidewalks, streetlights, community parks), but it is less suitable for soft social infrastructure that could result in an indirect redistribution of income. Examples here include homeless shelters, drop-in centres, temporary, transitional, and affordable housing, seniors' lodges, and addiction or recovery centres. Neither is the property tax well-suited for funding infrastructure that results in significant spillover benefits. For example, major urban expressways provide as much benefit to local residents as they do to outsiders who do not contribute to the residential property tax base. In these cases, infrastructure would be better funded through other forms of taxation.

B. LOCAL IMPROVEMENT LEVIES

Local improvement levies (special assessments or benefit assessments) are surcharges added to the general tax bill of owners whose properties experience an increase in assessed value as a result of new, expanded, enhanced, or upgraded infrastructure. Local improvement levies are charged against specific properties within a limited geographical area and are used to fund borrowing undertaken to finance local infrastructure improvements. With a local improvement levy, a municipality debt-finances infrastructure improvements

and the borrowings are recouped through a charge to local property owners.

There is debate over whether improvement levies constitute a tax or a user fee. Because improvement levies are not uniformly assessed against similar classes of property and the amount paid equals an approximation of the benefits that accrue to various properties in terms of increased value, the levy is not a pure tax. But neither is it a user fee—improvement levies are not directly charged based on usage and they are externally imposed. As such, local improvement levies are best described as a user tax or benefit tax—those who use or benefit from a specific public expenditure pay the tax to fund that expenditure.

Advantages

As a user tax, local improvement levies represent a significant improvement over the general property tax. Local improvement levies draw a link between those who benefit from an infrastructure improvement and those who pay—the cost is spread out according to the degree by which each property benefits. The degree of benefit is understood to be some measure of increased property value that results from the improvements. Whenever a tax directly equates to benefits, efficiency and accountability are maximized. The use of local improvement levies recognizes that infrastructure improvements that provide a general benefit to the whole community should be paid by the whole community through a general tax, while improvements that provide a specific benefit to a specific area should be paid by taxpayers in that area.

Local improvement levies can also be calculated in many different ways. This provides more flexibility than the straight-up general property tax, and allows costs to be recouped in a way that approximates the benefit. Frontage charges are the most common. With a frontage footage charge, the total costs of an infrastructure project are spread out to property owners based on the width of each property. These charges are best when costs increase with the width of a lot. Frontage charges are appropriate with things such as road re-paving and sidewalk repair. Other methods include charges based on acreage or lot size, the square footage of improvements on the land, or some combination of all three. Local improvement levies can also be charged through zone assessments, which apply more equally across a geographic

area and are linked to some estimate of assessed property values. Zone assessments are typically used for infrastructure investments that benefit entire neighbourhoods, such as improvements to a local park.

Local improvement levies tend to be more politically acceptable than a general property tax increase. Local improvement levies are an easier sell as property owners know what they will get for what they will pay. Sometimes, such levies are imposed at the request of a group of property owners or only after general consent has been given. As such, local improvement levies can also be part of a localized democratic decision-making process. In some cases, local improvement levies can be applied retroactively, unlike other sources of funding. Finally, debt funded through local improvement levies is not dependent on the general tax base—local improvement debt is self-funding debt.

Disadvantages

Local improvement levies do have a downside, and three in particular stand out. First, local improvement levies, like any earmarked tax, can be costly to administer. Local improvement levies require local approval, background work, analysis, special studies, extensive checking, record keeping, account management, and detailed reporting. Thus, the projects being funded through the levies need to be large enough to offset the effort and costs involved. Sometimes, this is not the case. Second, it can be difficult to establish nexus. In other words, what portion of an increase in property value results from the improvements and what portion is attributable to other unknown reasons? Establishing a proven nexus between an increase in property values and the provision of enhanced infrastructure is not straightforward. Rather, it can be quite difficult to isolate the impact of a capital expenditure from other influences on property values.

Third, not every community has the same ability to proceed with local improvement levies. Obviously, lower income neighbourhoods lack the same ability to fund improvements in this fashion. This has become somewhat problematic in the US where wealthier neighbourhoods and gated communities are quite willing to approve infrastructure improvements through bond issues and special tax assessments within their own boundaries, but are much less willing to help with the needs of other areas that desperately need similar improvements. The overuse of local improvement levies gives

rise to equity concerns. In Calgary, for example, some local communities have agreed to a special improvement levy to maintain their local parks and community spaces at a higher standard than other communities (Vander Ploeg 2004a).

Winning Conditions and Applications

In terms of usage, local improvement levies can fund a very wide range of municipal infrastructure servicing residential, commercial, and industrial properties. There are really only three limitations. First, the infrastructure must be local in nature but also involve enough up-front costs to make them worthwhile. Local improvement levies do not speak to large community-wide infrastructure assets such as urban expressways, major arterial roads, interchanges, transit, water treatment plants, and the like. While this infrastructure is a pressing need, municipalities cannot look to local improvement levies as a source of funding these assets. Second, local improvement levies are practical only for infrastructure where the beneficiaries can be identified and a close nexus established between that infrastructure and any increase in property value. Infrastructure where the benefits are more widespread or where it is difficult to identify beneficiaries will need an alternate source of funding. Third, the standard local improvement levy is difficult to employ in lower income neighbourhoods even if the infrastructure could theoretically be funded through such a levy.

Local improvement levies are an ideal funding mechanism to deal with the renewal, rehabilitation, and replacement needs of existing infrastructure. This is no small point. Dealing with existing infrastructure is arguably harder to finance and fund politically than the construction of new systems. As such, the local improvement levy is a critical part of any municipal infrastructure funding toolkit.

Local improvement levies have proven particularly useful when multiple types of local infrastructure can be bundled across a pre-defined area (Schmidt 2000). Examples of municipal assets that are good candidates for local improvement levies include underground utility upgrades (e.g., water, sewer and storm drainage), the paving and re-paving of local roads, repairs to sidewalks curbs and gutters, flood control, streetlighting, and various community enhancements such as off-street parking, landscaping, boulevard improvements, horticultures, and enhancements to local parks.

Local improvement levies are employed widely in both Canada and the US. South of the border, however, local improvement levies are often employed within formally designated improvement areas or financing districts. Some districts are purposed to provide a wide range of infrastructure improvements. Examples include community facilities districts (CFDs), community development districts (CDDs), and special improvement districts (SIDs). Other districts are established with respect to specific forms of infrastructure, and include local water and sewer districts, fire districts, or road improvement districts. In Canada, designated districts with their own local improvement levy or a specific property tax surcharge are generally limited to business revitalization zones (BRZs).

Local improvement levies used to be a more common tool, and many analysts argue that use of them should increase (see, for example, National Guide to Sustainable Municipal Infrastructure 2002).

C. SELECTIVE SALES TAX REVENUE

Some municipalities, particularly larger cities, have limited authority to levy selective sales or excise taxes on a narrow range of specific goods and services. Selective sales taxes are often applied to various municipal utilities such as water and sewer, as well as private utilities such as electricity and natural gas. Other utility operations such as telecommunications and cable may also be subject to taxation. Utility-based sales taxes or franchise fees are often charged in-lieu of property tax or charged as a fee for using municipal right of ways. The tax is usually some percentage of gross sales to customers. In the case of non-municipal utilities, the rates are either negotiated with the utility or set by the province. The rates are typically capped by provincial legislation.

Some municipalities also levy a selective sales tax on various amusements and entertainment events. Examples include commercial cinemas, fairs, concerts, theatres, and professional sporting events. The tax is usually a percentage of the ticket price. Municipalities are usually free to set their own rates, which are not generally capped by provincial legislation. In western Canada, Saskatoon, Regina, and Winnipeg all levy some form of entertainment tax. Other types of municipal selective sales taxes in Canada are very rare. One exception is the City of Vancouver, which levies a local 2% selective sales

tax on lodging. This rate is specified and capped by provincial legislation. The tax is administered at the provincial level and piggy-backs off the existing 8% provincial hotel tax.

Advantages

Compared to property tax, selective sales taxes are a more buoyant form of taxation, generating additional revenue as the local population grows and economy expands. Some selective taxes, like entertainment and local lodging taxes, also have the added benefit of targeting visitors to help pay for local infrastructure and community services.

Disadvantages

In the context of Canadian municipalities, the potential benefits of these taxes are overshadowed by the narrow range of goods and services to which they currently apply. Selective sales taxation tends to be a rather insignificant source of infrastructure funding even though it does hold great potential.

Winning Conditions and Applications

The current application of selective sales tax revenue is unclear since much depends on the municipality in view. For example, entertainment tax revenue in Saskatoon and Regina is discretionary; in Winnipeg, the tax has been earmarked for the local arts community, various sports teams and the city stadium. The local lodging tax in Vancouver is earmarked by provincial legislation, which requires the revenues to be spent on promoting tourism and the marketing of the city. In all likelihood, the great majority of the revenues from these selective sales taxes accrue to the operating budget or flow through to other local agencies. They are not a substantial source of funding for capital budgets.

D. INTERGOVERNMENTAL TAX REVENUE SHARING

Tax revenue sharing represents the middle ground between the standard federal or provincial grant and municipalities having the independent authority to levy a wider range of direct and indirect taxes at the local level. Tax revenue sharing occurs when the federal government or a provincial government transfers a portion of the revenue collected from a specific federal or provincial tax to a municipality. Virtually any tax levied at the federal or provincial level can be shared, including general retail sales taxes, selective sales taxes, and personal and corporate income taxes.

In Canada, municipal tax revenue sharing is generally restricted to the taxation of fuel and a few minor vehicle-related taxes. Federal-provincial-municipal agreements have recently been signed that will see up to 50% of the 10¢ federal fuel tax shared with all municipalities across the country on a per capita basis. Additional tax revenue sharing is limited to a small handful of larger cities that have negotiated separate agreements with their respective province. For example, the province of British Columbia shares 12¢ on each litre of fuel purchased in the greater Vancouver area with TransLink, the Greater Vancouver Regional District's (GVRD) transit system. TransLink also receives the 7% provincial sales tax on parking. The transit system in the Victoria Capital Region has a similar arrangement with the province, receiving 2.5¢ for each litre sold. The province of British Columbia also shares a portion of provincial traffic ticket revenue with municipalities. The cities of Edmonton and Calgary currently receive 5¢ for every litre of fuel purchased in their cities. The Agence Métropolitaine de Transport (EMT), Montréal's transit authority, currently receives 1.5¢ of the provincial fuel tax, along with a \$30 per car registration tax.

Municipal tax revenue sharing in Canada is quite limited, especially when considering the experience of municipalities in the US and western Europe. South of the border, state and local tax revenue sharing enjoys a much longer history and involves a much wider and more diverse set of taxes (Vander Ploeg 2002b). At the same time, there are some exceptions to this broader rule. First, the recent federal fuel tax revenue sharing agreement stands out as being quite unique. Direct federal to municipal tax-sharing in the US is rare—most tax-sharing occurs between the state and local governments, with federal tax-shared-revenues flowing first to the state and then trickling down to the counties and municipalities. Second, municipalities in Manitoba enjoy a special form of tax revenue sharing in that province. All Manitoba municipalities receive revenue equal to 2.2% points of the provincial personal income tax and 1% point of the provincial corporate income tax. These tax-shared-revenues are distributed to municipalities across the province in the form of an annual per capita operating grant, and are generally unconditional in nature.

Advantages

Tax revenue sharing has a number of advantages over the standard grant. The most obvious improvement is a measure of revenue diversity—indirect access to more and better forms of taxation. Because the shared taxes are imposed,

administered, and collected by provincial or the federal government, tax revenue sharing also avoids some of the distortions that can result from sales taxes that are levied locally. Tax revenue sharing, like grants, helps address vertical and horizontal fiscal equity concerns, and also provides cities with revenue to compensate for the costs generated by outsiders. Most importantly, tax-sharing has the added benefit in that the amounts are usually specified in a legislated formula. This helps ensure consistent and predictable streams of revenue while avoiding the frustrations and conflicts that inevitably build whenever grants are unpredictable or insufficient.

Disadvantages

The primary deficiency with tax-sharing as a funding concept again relates to accountability. On this front, there is very little separating tax revenue sharing from grants. Whenever revenue and expenditure decisions are made independently, accountability is muddled and the system tends to allocate resources less efficiently (Kitchen 1993). In Canada, both of these downsides are compounded by the narrow range of taxes involved—primarily motive fuel taxes. Fuel taxes, like property taxes, are a relatively inelastic tax. Since the fuel tax rate is not set as a percentage of the selling price but as a fixed dollar amount per unit, inflation eventually cuts into the revenues produced by the tax.

Most tax revenue sharing agreements are also short-term in nature. For example, the federal fuel tax agreement covers only a five year period, running from 2005/06 to 2009/10, which also reflects many of the provincial-municipal tax revenue sharing agreements. Furthermore, overall commitment to the idea of tax revenue sharing often appears weak. This is demonstrated by how easily the province of Alberta could scale back the 1999 fuel tax revenue sharing agreement signed with Calgary and Edmonton. In the fall of 2001, in response to falling natural resource revenue, the Province unilaterally reduced the rebate from 5¢ per litre to 4.25¢. Pressure from the two cities restored the agreement to its original intention, but such fiscal sideswipes still show some of the deficiencies that surround tax revenue sharing in Canada.

Winning Conditions and Applications

To offset concerns regarding accountability, most municipal tax-shared-revenues in Canada are conditional and earmarked for specific expenditures. In the case of fuel tax-sharing, the

revenues tend to be used for transportation infrastructure in general, or for specific transportation and public transit projects that have been agreed upon by the various orders of government involved. Thus, tax revenue sharing follows the principle of the user tax: revenues are directed to the funding of specific capital expenditures related to the tax in question. In Canada, fuel tax revenue sharing funds roadways, interchanges, overpasses, sidewalks, pedestrian walkways, bicycle trails, bridges, tunnels, and public transit.

The conditional nature of tax revenue sharing is intended to enhance accountability regarding the usage of the funds. In addition, municipalities may also have to file reports to federal and provincial governments on the specific use of tax-shared revenues. While this helps address the accountability concern, it also carries the ancillary effect of reducing municipal autonomy and local decision-making. Most tax revenue sharing is also dedicated to funding the pay-as-you-go envelope as opposed to funding the debt-financing of municipal infrastructure.

E. INTERGOVERNMENTAL TRANSFERS

Governments in Canada transfer among themselves a portion of the tax revenues they collect. These transfers occur because of various fiscal disequivalence or vertical and horizontal inequities. For example, some orders of government collect tax revenues in excess of their expenditure responsibilities while others have insufficient tax revenue. Transfers help match revenues with expenditure responsibility, thus providing better vertical equity among different orders of government. Transfers also allow less wealthy regions of the country to provide a minimum level of infrastructure and services compared to wealthier regions. This promotes horizontal equity. Such movements of tax revenue are referred to as grants, transfers, contributions, or donations.

Local governments in Canada receive grants from four sources: other municipalities, larger regional local governments, the federal government, and their respective provincial government. Inter-municipal grants are usually negotiated as a result of cost-sharing, regional cooperation agreements, or regional service provision. These grants comprise only a small proportion of municipal operating and capital revenues.

On the other hand, grants provided by federal and provincial governments are quite significant. These grants are dedicated

to both operating and capital budgets, and can be either restricted for certain purposes (conditional and specific) or unrestricted (unconditional and non-specific). Most capital grants—whether federal or provincial—are conditional in nature and often require a matching contribution from the municipality receiving the grant. Unconditional grants for capital are very rare—such grants are typically restricted for operating purposes only. A final type of municipal transfer is revenue-in-lieu of tax or payment-in-lieu of tax (PILOTs). These are special payments made by federal and provincial governments whose properties are exempt from municipal property taxation. While the amount of revenue-in-lieu of tax is usually negotiated, federal and provincial governments do exercise some unilateral control over the level of payments.

Advantages

For many municipal financial analysts, the main advantage of the traditional grant is clear enough—it is found or free money. However, the found money often comes with strings attached. Various cost-sharing provisions also mean that grants only pay out between 50¢ to 75¢ on the dollar. But some free money is better than no money.

For the less cynical, the advantages must be seen relative to the historical over-reliance of Canadian municipalities on the property tax. In this context, grants are not gifts intended to demonstrate benevolence. Rather, there is a complex economic rationale for municipal grants. Around the globe, municipalities that rely heavily on the property tax are also the most dependent on intergovernmental grants (Union of Nova Scotia Municipalities 2001). This is a noted feature of municipal finance within the British Commonwealth (e.g., Canada, Australia, New Zealand). This dependence on grants is no accident. Grants are necessary to provide vertical equity—closing the fiscal gap between revenues and expenditures that inevitably occurs when the property tax is the only tax tool available.

For example, the City of Ottawa estimates that it receives only 7¢ out of every tax dollar generated in the city. On the other hand, the federal and provincial governments receive 93¢. At the same time, the City of Ottawa notes that it is responsible for paying 80% of all the costs related to accommodating growth in the city. Without an adequate level of grants, the City will have to fund growth-related infrastructure with only 7% of the revenue actually generated from that growth itself. Grants are intended to offset this fiscal discrepancy (City of Ottawa 2005).

Second, grants are necessary for horizontal equity—providing adequate resources for those municipalities with an insufficient property tax base. Grants are also necessary to control for externalities and spill-overs. Because outsiders do not pay into the local residential property tax, grants flow to municipalities so they can provide services for non-residents without increasing the property tax burden on local residents. A steady and predictable flow of municipal grants is more than greasing a squeaky wheel—it forms part of the fundamental financing of municipalities (Vander Ploeg 2002a).

Disadvantages

With respect to infrastructure, grants carry several problems. The most often heard complaint over the past decade has simply been the drastic reduction in federal and provincial support. This reflects the unilateral nature of grants, which are provided at the discretion of the authorizing government. Grants have proven to lack predictability and reliability, and have often been too ad hoc in nature. The recent spate of federal infrastructure programs was a significant improvement, building off several successful tripartite development agreements in the late early 1990s (e.g., the Winnipeg and Vancouver Development Agreements).

The administration of federal and provincial grant programs could always be improved, but such improvements do not speak to the economic disadvantages. Maintaining a system of conditional capital grants is a costly exercise, both politically and economically. Grants result from a process of political negotiation, and the specific covenants and agreements surrounding them result in fiscal leakage. None of this helps fund the infrastructure on the ground.

Grants also distort local decision-making and make cities vulnerable to the priorities of other governments. This is especially the case with respect to conditional grants that encourage spending in certain areas that may not be a local priority. Virtually every city has its own story of how property tax dollars were diverted to take advantage of a new grant for a recreation centre when a new wastewater treatment facility was the higher priority. Grants are not always directed to the biggest need, and they have also been criticized for their lack of equity. For example, one recent infrastructure initiative focused on green infrastructure and water and sewer upgrades. Many cities fund their water and sewer utilities through user fees, and that infrastructure is sound.

Other cities only partially fund them with fees, and their infrastructure is struggling. Here, grants give an advantage to cities that have not properly funded their utility infrastructure (Vander Ploeg 2003).

The problem is not limited to conditional grants. Unconditional grants also create distortions through their effect on prices. A grant is essentially a subsidy from one government to another. Thus, infrastructure and services that are subsidized through grants have lower costs relative to non-subsidized infrastructure and services. These lower costs result in greater spending in subsidized areas relative to non-subsidized areas. In other words, the effect of grants on pricing leads to inefficient revenue decisions. Grants result in prices being set lower than they would in the case of no subsidy. This leads to over-provision and over-consumption of certain infrastructure and services, and artificially increases the demand for even more infrastructure (Kitchen 2003).

Many municipal financial analysts are highly critical of grants, and even lay much of the current infrastructure problem at the feet of grant-based funding. Grants have resulted in a lack of fiscal discipline at the municipal level. Because much of Canada's municipal infrastructure was put in place by grants, municipalities felt no need to recover the amounts through annual asset replacement charges. This had several effects. First, a major cost component was not recorded. Second, the prices and taxes charged were lower than they should have been. In turn, this led to the construction of more infrastructure than could be justified or realistically afforded in the absence of the grants. Third, as the infrastructure started to deteriorate 30 and 50 years later, there were no sources of revenue set aside for replacement (Kitchen 2003). Grants also created a bias against the maintenance of existing infrastructure by favouring new construction. In short, more grants are not the answer to the infrastructure challenge, they are part of the problem.

Grants are also criticized for their lack of transparency and accountability. Whenever the government raising the tax revenue is not the same government spending it, accountability becomes blurred. For many, this problem has become endemic across the Canadian federation. While the provinces are busy blaming Ottawa for the lack of adequate funding for health care, municipalities are pointing their collective finger at Ottawa and the provinces for their lack of

financial support with respect to infrastructure. Taxpayers, caught in the middle of the fiscal confusion, are not sure who is to blame.

Winning Conditions and Applications

Given the host of financial and non-financial complaints levied against grants, one is hesitant to recommend areas where they should be used. But as long as Canadian municipalities find themselves singularly dependent on the property tax, they will not be able to escape their need for grants. With this caveat in mind, grants could be improved and applied more effectively. In terms of the administration of grants, ensuring better predictability would provide a closer match between the grants expected and the planning horizons for municipal infrastructure—horizons which often stretch out for 3, 5, and even 10 years or more. More flexible cost-sharing arrangements would also ensure better access to various grants.

Several characteristics of infrastructure lend themselves to the granting approach. First, usage of the infrastructure is a particularly important consideration. Transfers are best reserved for those infrastructure assets that produce positive externalities and significant spillovers—where usage by non-residents is particularly high. This keeps the focus on the broader economic rationale behind grants, which is to produce better vertical and horizontal equity. It is one thing for a grant to be used for an urban expressway used by commuters, truckers, and tourists and quite another thing for a grant to be used for the local neighbourhood hockey rink that has little draw from outside the local community.

Second, grants also have an important role to play with regard to highly regulated infrastructure and services. For example, federal and provincial governments often set certain environmental standards with respect to municipal infrastructure and services. Grants are a logical way to help municipalities achieve those standards.

Third, grants should be reserved for lower priority and less visible infrastructure that tends to carry less public support. This approach reserves property tax dollars and future property tax room for the more popular and highly visible projects, all of which are an easier sell politically. The current approach to grants can work against this broad principle of application. For example, many federal and provincial

grants are directed to new infrastructure construction or the wholesale replacement of existing assets while maintenance, renewal, and rehabilitation spending tends to receive less attention. At the same time, they are also the activities that are most difficult to finance and fund. Granting programs should not be ignoring this type of infrastructure spending.

Fourth, because grants do not promote the accurate pricing of infrastructure and its corresponding service, grants are a particularly poor fit for infrastructure that is inherently marketable. Grants should not be used to subsidize user fees for water treatment and distribution, wastewater collection and treatment, storm drainage, solid waste services, recycling, or other marketable infrastructure that can be provided on a self-financing and user pay basis. Applying grants to these types of infrastructure systems amounts to a lost opportunity for better pricing and more efficient and cost-effective provision. At the same time, grants do have a role to play in terms of marginally marketable infrastructure. However, the emphasis here should remain on the idea of specific credit enhancements—both financial and non-financial—and the objective should be to help infrastructure projects achieve commercial viability.

For most municipalities, grants tend to be used to fund the larger pay-as-you-go financing envelope, as opposed to funding borrowing. Oftentimes, the sheer size and cost of many large infrastructure projects is advanced as the primary rationale for federal and provincial grant assistance since these present a difficult challenge in terms of the pay-as-you-go approach. While large projects with high up-front costs and long asset lives often attract grants, this may not be helpful when viewed from a wider financing perspective. Large and expensive infrastructure is typically suited to a debt-financing approach. In such cases, grants would be better used as a source of longer-term funding for the debt-financing of such infrastructure. However, given the historical lack of predictability and reliability of grants, using them as a source of long-term debt-financing would be very risky, if not entirely impossible.

In the end, size and cost should not be the only criteria driving the decision for a grant-based funding approach. With respect to grants, some infrastructure characteristics involve a clear trade-off (e.g., water provision). Grants can help with financial costs of keeping a water treatment plant up to

federal and/or provincial standards, but the plant itself can be provided on a user pay basis. In this case, the marketability of the infrastructure trumps its regulated nature since the costs of regulation can be easily built into the user fee structure.

F. OTHER GENERAL PURPOSE REVENUE

Most municipalities have access to certain miscellaneous revenues that are neither tax nor user fee-based. For example, most municipalities earn interest income on financial investments, while others collect annual dividend income from municipally-owned corporations. Other sources of income include tax penalties and fines for parking violations.

While miscellaneous often means insignificant, there are exceptions to this rule. For example, the City of Edmonton's Ed Tel Endowment Fund currently has a market value of \$677.7 million—equivalent to 41.6% of total revenue for the year. In fiscal 2004/05, this investment generated a good portion of the \$103.9 million in investment income earned by the City. In the same year, Edmonton's electrical and water corporation—EPCOR—provided \$187.2 million in net earnings. These two revenue sources combined provided 17.9% of Edmonton's total operating and capital revenue for 2004/05. In Calgary, the net earnings of ENMAX contributed \$116.8 million or 5.4% of consolidated revenue over the same time period.

Advantages

Investment income and the profit of municipal commercial operations do not depend on the local tax base. Neither does the city have to directly levy its own user fees, which are determined indirectly by the corporation. In the case of some cities, these sources keep property taxes down while they also boost the funding for tax supported infrastructure.

Disadvantages

At the same time, the revenue is not always available for the taking. Investment income can be rather volatile and a portion should always be used to inflation-proof the principal portion of the investment. At least a portion of the net earnings of municipal corporations should also be retained for their own capital purposes. More important, these sources of revenue tend to accrue only to a select handful of larger cities.

Winning Conditions and Applications

Investment income, corporate earnings, fines, and other revenue are generally unrestricted. However, they should only

be directed to infrastructure that has to be funded through taxation. These revenues essentially subsidize taxpayers by creating a cushion in the property tax. This allows the property tax mill rate to be set lower than it would be if these other revenues were absent. As such, municipalities that collect a significant amount of these revenues should consider how that tax cushion can be used to fund capital on a go-forward basis.

2.1.2. Innovative Taxation

A. TAX INCREMENTAL FINANCING

Tax incremental financing (TIF) combines the earmarking of property taxes with a special version of the revenue bond and has emerged as one of the most popular tools for financing and funding redevelopment in cities south of the border. With tax incremental financing, a city issues a TIF bond (or the more generic redevelopment bond) to finance infrastructure improvements in a specific area of the city. The security for the TIF bond is the additional property tax revenue that results from the increase in assessed values produced by the infrastructure investment. In short, TIF is a way for cities to leverage future growth in their property tax revenues as the means to fund the debt-financing of infrastructure development.

In the US, tax incremental financing is used primarily to restore and redevelop urban brown-fields or blighted areas. TIF does this by returning marginal, under-used, ill-used, or environmentally compromised properties to more productive use. This increases the assessed value of those properties. The resulting expansion and increase in value of the tax base generates new property tax revenue for the city. This increased revenue is earmarked to repay the debt incurred to finance the new infrastructure—all without raising the property tax rate.

While each tax incremental financing project is unique, the majority tend to follow a standard process: a blighted area of the city is designated as a possible TIF district or tax incremental district (TID); a project plan for redevelopment is prepared and aired at various public hearings; the plan may also be subject to approval from a review board; and state approval may be required.

Prior to making infrastructure improvements in the TIF district, the assessed value of all properties in their current state is established. This assessment is frozen for the duration of the TIF project and comprises the baseline property value. The city then issues a TIF bond. The proceeds are used to assemble land and cover the costs of site clearance, remediation, and the construction and rehabilitation of various local infrastructure. Because the infrastructure improvements make the land more attractive to private developers, they begin purchasing properties in the TIF district. In some cases, city-owned land is sold at a discount to strengthen the stimulus for private development. As private investment occurs, property values across the TIF district increase—the tax incremental base.

Tax incremental financing involves two types of property taxes. The first tax is on the baseline property value. This tax continues to go to the general revenue fund of the city and any overlapping jurisdictions that also collect property tax. The second tax is paid on the incremental increase in the assessed values of the properties after redevelopment. This tax revenue is earmarked to a special municipal fund used to repay the TIF bonds taken out to finance the infrastructure improvements, as well as any loss incurred on the sale of land. By earmarking the tax increment, TIF allows the general property tax to mimic local improvement levies—infrastructure improvements in a specific area are funded with the property tax generated in that area. However, the new tax revenue is generated by growth in the property tax base, not by increasing the tax rate or imposing a new tax levy. When the borrowings are repaid (they are usually amortized over a 15 to 25 year period), the TIF is closed and all revenue diverts back to the general revenue fund and any overlapping jurisdictions.

There are numerous variations on this broader TIF theme. For example, enterprise zones are designed to lure private investment through various tax incentives such as corporate income tax holidays, accelerated capital cost allowances, reduced property taxes, and other tax abatement measures. While such approaches are often confused with tax incremental financing, it is important to understand that a proper functioning TIF involves no tax abatements—all property owners in a TIF district pay the full value of their taxes owing. A portion of the tax simply goes to pay off infrastructure debt. A more closely related variant is the equivalent grant (TIEG).

This is a hybrid of the enterprise zone and tax incremental financing. With a TIEG, a city designates an area needing redevelopment but the private developers arrange their own financing. The city organizes the TIF district but returns a portion of the tax increment to the private developers in the form of a grant (Burleton 2002).

Tax incremental financing is not generally permitted in Canada, but it does have a long history in several US states. In 1952, California became the first state to authorize the use of TIF. By 1970, six more states had followed (Minnesota, Nevada, Ohio, Oregon, Washington, and Wyoming). By 1997, 48 states had enacted legislation providing for TIF. The District of Columbia (DC) joined the group in 1998. Today, only North Carolina and Delaware do not allow TIF (Devine 2002). It is generally acknowledged that the mid-western states rank among the highest users of TIF. Tax incremental financing is used the most heavily by cities in Wisconsin, Illinois, Indiana, and Minnesota. The states of Nebraska, California, Colorado, and Florida also make extensive use of TIF.

The widespread adoption of tax incremental financing since the 1970s reflects several unique features of the US urban experience. The decline of large urban areas—particularly central city cores—created a growing need for redevelopment. At the same time, federal assistance for urban renewal fell off and voters continued the trend of turning down property tax increases and the issuance of general obligation debt. All of these provided a powerful stimulus in favour of tax incremental financing, which has proved to be an effective way to get debt-financing back into play, work around state and local tax and expenditure limits, and provide an alternative to voter frustration with the more traditional funding options.

Advantages

It is not hard to see the attractiveness of tax incremental financing. TIF is not a property tax increase—the additional revenue accrues from a healthier tax base. Neither is TIF a tax exemption—all property owners continue to pay the full value of the taxes they owe. By leveraging future tax revenues, the borrowings behind a tax incremental financed project are self-supporting. Indeed, a properly designed TIF will survive on its own cash flow. This self-funding nature makes TIF politically popular. It also allows other sources of funding, such as municipal capital reserves, to be kept intact.

Because TIF bonds are not generally secured by the full faith and credit of the city, the debt incurred does not count against legislated municipal debt limits. While such borrowing is more expensive than the traditional GO bond, it is less expensive than private borrowing. If they meet certain criteria, TIF bonds can be issued on a basis, which heightens the advantage over other approaches such as development cost charges (DCCs). In some projects, TIF bonds are bundled with other revenue bonds for water and sewer enhancements. In this way, TIF acts as the linchpin for a much broader financing package for a wide range of infrastructure improvements.

A unique advantage of TIF is how it stimulates private sector interest and investment in the urban core of large city-regions, and puts them on a better competitive footing relative to ongoing development in suburban and metro-adjacent areas. Properly employed, tax incremental financing offers the prospect of mitigating urban sprawl, one of the key factors driving the larger urban infrastructure challenge.

Tax incremental financing is used only for the public infrastructure contribution of a much larger redevelopment project, but this contribution is the lever for private involvement which is essential to much of the redevelopment. As such, an often discussed advantage of TIF is how it contributes to the broader goal of local economic development. By stimulating private investments that may not otherwise have occurred, TIF improves the economic base of various neighborhoods and the larger city itself. This results in increased tax revenue for all orders of government. TIF accomplishes this without tapping into general property tax funds or levying special assessments on property owners, but by dedicating future tax dollars to a specific redevelopment project. TIF reduces the risks facing the private sector in redevelopment by providing assurances that their investments will be contributing to a much larger revitalization effort.

Disadvantages

Tax incremental financing has a lot of upside potential, but the process is not risk-free. The biggest risk is that a TIF project may not attract sufficient private interest and the incremental tax revenue growth fails to materialize. To prevent a default on the bonds, the city is forced to draw on its general revenues. In such instances, tax incremental financing represents the classic financial boondoggle drawing on taxpayer dollars. In such instances, the very purpose and rationale behind TIF is completely undermined.

Tax incremental financing also results in at least some fragmentation of the property tax base. TIF converts a stagnant neighbourhood into a prospering one, which then retains all the growth in the property tax for its own development, as opposed to contributing to infrastructure investments and redevelopment across the city or in other less prosperous neighbourhoods (Devine 2002). While this is a common criticism, it is important to also note that the degree of fragmentation is dependent on the number of TIF projects in a city. Furthermore, fragmentation is temporary in nature since all property tax revenues from a TIF project will eventually end up in general revenue.

Tax incremental financing also involves higher-priced debt, since the risk of default is transferred to anticipated revenues as opposed to the tax base. Like any revenue bond, TIF bonds can involve interest costs up to 300 basis points higher than a comparable GO bond (Burleton 2002). The timing of debt repayment can also be an issue. TIF may require debt service payments to be made before any tax revenue gains have been realized.

Tax incremental financing has also been accused of promoting a beggar-thy-neighbour approach to local economic development by diverting funds to particular neighbourhoods at the expense of other neighbourhoods and the community as a whole. If TIF shifts development from more productive locations to less productive ones, then overall economic growth is slowed. A recent study in Chicago—a heavy user of TIF—found evidence to support this claim. The study suggested that total assessed property values in cities that used TIF grew more slowly than those of cities that did not (Devine 2002).

In light of this concern, the general consensus is that tax incremental financing should only be used when it is clear that no private development will occur in a particular neighbourhood without it. In the US, there have been instances where TIF has been accused of encouraging private development that would have occurred without a TIF. In these cases, the process has resulted in windfalls for developers and helped promote suburban green-field development and the big box store.

Some of the biggest criticisms, however, revolve around the redistributive impacts of tax incremental financing. Two

concerns in particular stand out. First, tax incremental financing results in a loss of tax revenue for the general revenue fund. Not only does this make it more difficult for cities to respond to increased service demands, it may result in other property owners outside the TIF zone having to pick up the slack. In addition, redevelopment in a TIF zone will almost certainly increase the costs of providing various services such as policing, fire protection, sanitation, and transportation. Because a portion of the property tax base has been frozen, regular property tax revenues in the TIF zone could fall short of meeting these costs. Again, property taxpayers in other areas of the city may have to pay the tab. To defray this effect, some US cities also earmark a portion of the estimated increase in local sales tax or income tax revenue generated by the TIF to cover these additional costs.

The second issue revolves around the role played by counties, school boards, and other special districts that share property tax room with the cities. Traditionally, TIF restricts the property tax take of these local governments to the portion of the tax base that has been frozen at the pre-development level. Because the entire tax increment flows to repay TIF bonds, these jurisdictions lose out on future property tax revenue. Only when the TIF is closed will they begin to receive their share of the incremental revenue accruing from the expanded tax base. Not only does this make it difficult to negotiate TIF proposals, it has created more than its fair share of conflict.

Both of these concerns have led some to argue that TIF acts as a self-funding mechanism because it kidnaps a portion of tax revenue that should accrue to other local governments and relies on other taxpayers to subsidize those in the TIF zone. While TIF involves no direct draw on the general property tax base, it does involve an indirect and less visible draw. This is especially the case if other property owners outside the TIF zone have to pick up any slack in the general revenue fund. As a result, some argue that TIF spending receives less public scrutiny than other forms of city spending, and thus, governments are less accountable with these tax dollars.

The net effect of these two objections is very difficult to unpack because tax incremental financing produces a number of spillover benefits that act as a counterweight. For example, the benefit of a TIF project is not restricted to the TIF zone. Redevelopment projects always produce some larger regional benefits, one of which is increased property

values in areas adjacent to the TIF zone. This is especially the case for larger TIF projects, whose reach can extend across a city. To the extent that a TIF project provides benefits across the larger city, this should offset some of the concerns of the effect on other property owners. In addition, tax incremental financing will ultimately boost the property tax revenue of all overlapping jurisdictions. Yet, those governments have taken on very little risk. They have foregone some property tax revenue during the interim, but that is simply an investment on their part that will also yield significantly higher tax revenues after the TIF is closed.

All of these disadvantages are complicated even further by the potential displacement of residents and businesses located in or near urban brown-fields and other impoverished areas that are the primary target of tax incremental financing.

Winning Conditions and Applications

Concerns regarding tax incremental financing have forced continued experimentation and refinement in the US. To ensure that TIF projects have the best shot at financial viability, projects are preceded by extensive feasibility studies that assess the revenue risk and outline strategies to ensure the project will have sufficient cash flow. Accuracy in revenue projection is essential; property tax revenues must be estimated conservatively and cautiously and allowances made for potential fluctuations in the real estate market, construction delays, and other factors. A key part of the planning is to apply TIF only in those areas that have the potential to realize substantial tax increments through increases in assessed values, and where the resulting economic development will produce new streams of personal and business income. Experience has shown that TIF zones with the most vacant land before improvements begin, such as large abandoned industrial sites, show the greatest tax increment growth. Many of these plans contain a contingency provision outlining how the initial debt will be renegotiated, refinanced if TIF revenues fall short.

Aside from studies and planning, many US cities have devised a number of specific strategies to mitigate the risk of TIF revenues failing to materialize. Some cities are now creating larger TIF zones which spread out the risk. Other cities build in a source of back-up revenue in the TIF plan. The City of San Jose uses another strategy—the joint-financing of TIF projects. With joint-financing, a few bonds are issued to cover

all the various TIF projects in the city and the tax increments are combined to service the debt. In their 2003-2007 capital improvement plan, San Jose reported 157 capital projects in TIF districts across the city with a total cost of \$882 million. Other cities keep the TIF zones separate, but will use the tax increments of successful TIFs to subsidize ones that have proven less successful.

Another strategy is to actively partner with private developers who are willing to provide a loan guarantee for the TIF bonds issued by the city. For example, Chicago has a TIF deal with Sears that involved the development of a new office park. When the TIF revenues have fallen short, Sears has paid the difference and prevented a default on the bonds.

Like all forms of earmarking, TIF can lead to a fragmentation of the property tax base. This is also a concern with local improvement levies. To manage this concern, the number of TIF districts operating at any one time should be restricted.

The issue of higher-cost debt and managing debt service payments before tax increments materialize have also received attention. Both of these concerns are helped by the strategies above as well as other approaches. For example, the bundling of various TIF districts and cross-subsidization between independent TIF projects lowers the risk of default and can attract a lower rate of interest on TIF bonds. Other cities back their TIF bonds with local sales tax revenue to reduce the cost of borrowing. To manage any difficulty with the timing of debt repayment, some cities use general tax revenue for the first few years of payments or simply fold in the first few years of the debt service payments into the initial borrowing for the TIF project. Other cities make use of the many different types of municipal bonds discussed earlier, particularly those options that allow principal payments to be deferred until a later period in the repayment schedule.

The issue of whether TIF redirects developmental activity from more productive locations to less productive ones is a huge question from an equity and efficiency stand point. The impact on overall economic growth is no less important. As such, cities should always proceed with caution and subject TIF proposals to in-depth economic cost-benefit analysis. Cities should be able to answer how a TIF development in one area will affect development elsewhere, and whether the economic and social benefits of a TIF project outweigh

the anticipated loss in tax revenue over the short-term. In particular, will this loss in revenue eventually be recouped and sufficiently compensate for the costs—plus interest—of the improvements and any land write-down that occurs?

Success with tax incremental financing requires more than establishing a TIF district as a one-off project separated from the broader goals behind municipal planning. Instead, the TIF tool should be folded into larger growth management and redevelopment strategies. To facilitate this integration, some in the US have argued for the establishment of public benefit corporations to oversee all TIF districts and ensure they are linked to the larger municipal planning process. This is not always easy. A big question surrounding TIF is simply the lack of knowledge about how private development responds to major public infrastructure projects. This is one area where continued research is very much needed.

Of no less concern are sweetheart deals between cities and private developers that result in TIF subsidizing suburban green-field development and, in turn, urban sprawl. This perversion has given rise to what is commonly termed the “but for” test. This rule states that TIF should only be employed when there is very strong evidence that absolutely no private development will occur in an area without—but for—TIF. Ignoring this rule is at the root of most problems. In the US, most state governments that permit the use of TIF have also set out specific provisions that define a blighted area and force cities to undertake specific measurements and actively defend their conclusions before a TIF district is established. Because such tests can never be completely objective, it is important that the bar not be set too low and that the various requirements are also uniformly and rigorously applied.

Strategies to deal with the equity issues of taxpayers subsidizing TIF districts and the concerns of overlapping governments must also be developed. Here, it is vitally important not to restrict the consideration of cost to the infrastructure only. Redevelopment across a TIF district often entails additional operating costs in terms of increased municipal services. These costs must be factored into the larger TIF development plan. With respect to other local governments, some US cities now cap the amount of tax increment that can be earmarked to repay TIF bonds. Once that cap is reached, all taxes (including the increment) go back to general revenue and any overlapping jurisdictions.

This distributes the proceeds for successful TIF projects, and makes them easier to negotiate. Some state laws now require that overlapping entities get a share of the tax increment from the outset through various pass-through provisions. This is now the case in California, where all TIF projects must allocate a fixed percentage of the tax increment to other local governments, and this percentage increases with the age of the TIF project (Devine 2002). While all of these measures help address some of the intergovernmental equity concerns with TIF, they also inject a certain degree of increased complexity and uncertainty into the process—underscoring again the need for careful revenue projections.

A clear winning condition for any TIF project is that it be created in a spirit of openness with a premium placed on accountability. All stakeholders in the proposed TIF district must work toward a consensus on TIF projects and be committed to transparency. This should be combined with regular reporting, audits, and proper accounting. Given possible displacement of residents and businesses, it is clear that TIF must be applied selectively and carefully.

Despite the many pitfalls associated with tax incremental financing, it has one very strong over-arching advantage. This advantage is directly related to the type of infrastructure for which TIF is uniquely designed—the renewal, rehabilitation, and replacement of existing infrastructure in areas desperately needing redevelopment. Enabling these types of infrastructure projects inside the central core of larger cities is something that is not easy to accomplish with other funding tools. In addition, TIF allows cities to maximize the usage of existing infrastructure rather than building out new infrastructure. TIF also leverages other important policy goals such as improving undeveloped land, demolishing blighted properties, and brown-field remediation. TIF is a tool uniquely designed to promote downtown revitalization, rehabilitate declining property values, and promote new commercial activities and industrial development.

Depending on state legislation, tax incremental financing districts have been designed for residential, commercial, industrial, and mixed-use developments. While TIF can be applied to a wide variety of municipal infrastructure, the risks involved generally limit its application to smaller and medium-sized public works. For very large infrastructure with significant up-front costs, TIF is usually folded into a joint

venture with a group of private partners, an approach that resembles less a TIF and more of a public-private partnership. One of the most costly TIF projects that have been completed was the construction of the United Airlines Maintenance Center in Indianapolis in the early 1990s. Total costs of the project were over \$1 billion US, but those costs were shared between the City of Indianapolis, the State of Indiana, and United Airlines. Indianapolis financed only about \$240 million of the project with TIF. The upper limit for TIF may have recently been set by the proposed No. 7 subway extension in Manhattan's far west side. At an estimated cost of \$1.5 billion, the project would be the largest TIF proposed in the US to date.

In terms of specific municipal infrastructure, TIFs have funded land acquisition, site preparation, and the rehabilitation and reconstruction of streets, sidewalks, curbs, and gutters. TIF has also been used to develop interchanges, rapid transit stations, transit extension, transit stops, and parking facilities. TIF is also suited for boulevard reconstruction, streetscaping, landscaping, street furniture, streetlighting, and improved pedestrian access. TIF has also helped fund the development of riverfronts and outlooks, as well as public parks and recreational and cultural facilities.

In some instances, TIF has also been used to expand and rehabilitate sanitary sewage collection systems, storm drainage, and water mains. The construction of new wells and water storage facilities have also been funded by TIF. Some of the larger and more public TIF projects have resulted in improvements to universities, theatres, schools, and the development of new downtown malls, central libraries, integrated hotel and convention centres, arenas, museums, entertainment complexes, and professional sports stadiums such as the Target Centre in Minneapolis.

The relevance of tax incremental financing to Canada is dependent on whether sufficient conditions currently exist to produce self-funding TIF projects, or whether other legislative and financial changes are needed. Some features of the Canadian urban experience introduce difficulties in this regard. For example, Canadian cities do not have access to bond financing, which lowers the overall cost of borrowing and increases the financial viability of TIF projects. In some US cities, the incremental growth in sales and income tax revenues spurred by TIF have also been used to backstop

Tax Incremental Financing: A Snapshot of the US Experience

Nebraska: Nebraska passed TIF legislation in a 1978 referendum. The law allows TIFs to be used for redeveloping blighted or substandard areas within a community. According to a March 2005 Nebraska Department of Property Assessment and Taxation report, 69 state municipalities were engaged in redevelopment projects using TIF. In 2004, 393 TIF projects worth a total of \$25.7 million (US) in public investment were occurring across the state.

California: California was the first state to pass TIF legislation in 1952. While California now uses this tool less often than other states, TIF is still used to fund large redevelopment projects. In Los Angeles, TIF was used to help fund a new central library at a cost of \$136 million (US) and a new convention center at \$125 million (US). In Fremont, TIF has enabled the upgrading of four major interstate interchanges as well as the Bay Area Rapid Transit (BART) station.

Wisconsin: Cities in Wisconsin are some of the heaviest users of TIF in the US. Since legislation allowing TIF was established in 1976, cities across the state have established almost 1,200 TIF zones. From 1992-2001, TIFs in Wisconsin were responsible for leveraging almost \$1.3 billion in funding for infrastructure improvements across the state.

Illinois: When it comes to the use of TIF, Illinois is arguably the US leader. The use of TIF began there in 1978, but the bulk of TIF districts were added since 1990. As of January 2005, there were 874 TIF districts operating in 353 communities across the state. While the tool is quite common in municipalities with populations under 10,000, the preponderance of TIF in Illinois is a direct result of heavy use in Chicago. Data for 2002 show that there were 129 TIF districts operating in the Chicago. TIF districts in Chicago currently cover 30% of the land area. By the year 2000, over \$2 billion of public-private investments were made in Chicago's TIF districts, resulting in the creation and retention of over 28,000 permanent jobs. Through TIF, it is estimated that \$272 million of public investment has generated \$1.7 billion of private investment—for every dollar the City of Chicago has invested in TIFs, the private sector has invested \$6.30.

The bulk of TIF in Illinois is used for neighbourhood revitalization, including the re-developing of mixed non-central business districts, central business districts, industrial re-development and conservation, housing re-development, strip malls, and commercial mall area developments. In Chicago alone, TIF has enabled the creation of 3.7 million square feet of new office space, 1.1 million square feet of new retail space, 1.6 million square feet of new and rehabilitated industrial space, 422,000 square feet of rehabilitated commercial space, and 1,103 new residential units. TIF has also been used to expand the University of Illinois, to renovate several theatres, and for extensive streetscaping of Michigan Avenue in the Central Loop area.

Four specific examples are worth noting. The Gateway Shopping and Transit Center on Howard Street is Rogers Park's first new retail development in many years. The use of TIF has allowed Chicago to acquire and clear the property to make way for the implementation of a new community-based redevelopment plan. In the community of Lawndale, a new grocery and retail complex is being constructed, along with a new movie theatre with ten screens. This is part of a new community-based redevelopment plan that has been in the works for several years and would not have occurred without TIF-based funding. The Kinzie Industrial TIF on Chicago's west side is not only investing in improved roads and viaducts but also clearing abandoned and obsolete buildings to create a new urban industrial park. Local neighbourhood activists are hoping to use TIF to establish a new community-industry training center to train residents for jobs with local manufacturers.

One of the most highly publicized uses of TIF in Chicago is the Central Station TIF, which covers a large area of abandoned rail yards just south of the Chicago Loop. The TIF-backed Central Station development paid for new upscale condominiums and townhouses as well as new streets, sewers, water service, and other infrastructure on the former Illinois Central Railroad site. The Central Station TIF served as the essential development beachhead for an area of the city that had seen little new housing construction or commercial development for years. Almost 40 new townhouse and condominium projects have been proposed. The resulting market impacts prompted the City of Chicago to expand the size of the Central Station TIF by 300%, creating the Near South TIF. At the time of its passage, this is one of the largest TIF districts in the US.

TIF debt and increase the odds of financial viability. But, Canadian cities do not have access to these types of taxes. Unlike US cities, most Canadian cities do not share property tax room with numerous overlapping authorities—education being the only exception. To the extent that TIF depends on capturing the property tax increments of overlapping authorities, Canadian cities may not be well placed to realize self-funding TIF projects. The relevance of TIF also depends on the availability of the right forms of infrastructure to which it can be applied—infrastructure in areas of urban blight and brown-fields that will not attract private investment without some municipal involvement. Since Canadian cities tend to have less urban decay than comparable US cities, can enough TIF projects be developed that will pass the “but for” test?

In the end, tax incremental financing represents a politically viable tool for local governments to publicly finance infrastructure and other economic development initiatives without drawing on existing revenues or proposing new taxes (Devine 2002). The potential of TIF has been well demonstrated south of the border, and increased experimentation with the tool is reigning in some of its inherent disadvantages. It is not surprising that TIF is now beginning to draw attention in Canada as well. For example, the City of Calgary is currently exploring a TIF for redevelopment of its East Village neighbourhood in the downtown core. At some \$70 million, the East Village project would be a large TIF by most standards. If Calgary can succeed in moving a TIF project forward, that will could well serve as the template for more Canadian attempts.

B. IMPLEMENT NEW TAXES

With few other taxes at their disposal, Canadian cities are highly dependent on the general property tax. The property tax is supplemented with user fees, federal and provincial grants, and other revenues. But user fees have limited revenue generating capacity—they attach only to specific services and infrastructure and any increase is usually offset by rising costs. Federal and provincial grants are outside the control of cities and have yet to recover to historical levels. Other revenues are relatively insignificant as a source of infrastructure funding. As a result, much of the debate over funding urban infrastructure is dedicated to the potential of a more diverse tax mix to address concerns with this singular over-reliance on the property tax, its inability to

produce sufficient revenue, and practical and political limits to expansion of the tax. Fuelling the debate is a recognition that most of Canada’s competitor cities—whether European, Asian, or American—have significantly greater access to a wider range of taxes (Vander Ploeg 2002a).

A lack of diversity in municipal tax tools is the key issue. The purpose of innovation here is to intentionally diversify the tax system of Canadian cities in two ways. First, the general *ad valorem* property tax is retained as a foundational tax, but various reforms are pursued and additional types of property tax or other real estate taxes are secured. Second, these property taxes are then supplemented with a range of other taxes. Appropriate examples of other local taxes in play across Europe, the US, and Asia include a small local general sales tax and various selective sales and excise taxes on lodging, restaurants, liquor, and other consumables. Options also include a range of vehicle-specific taxes such as a local fuel tax and taxes on car rentals and parking. Also on the list are personal and corporate income taxes and a wider range of business taxes that more closely link to net sales or profit as opposed to property values.

None of this is to say that a drastic increase in municipal taxation is the silver bullet to the infrastructure challenge—it is not. Nor is such a prospect at all innovative. Rather, the primary thrust is to change the way in which cities collect tax revenue. What is in view here is not just how much taxes are collected, but how they are collected, from whom they are collected, and how they are implemented and subsequently administered. The way a tax system operates and the types of taxes in play are just as important as the total value of the tax revenues collected – if not more so.

Advantages

The rationale for municipal tax diversity rests on a complex argument that weaves together a variety of fiscal and demographic considerations with concerns over governance and certain economic and political factors (Vander Ploeg 2005). Fiscally, a more diverse tax system would result in better revenue growth. This growth would not be achieved by intentionally increasing property tax rates year over year, but by cities having access to a wider variety of taxes that more strongly link to local population and economic growth. An expanded set of tax tools yields better growth in municipal revenues by allowing cities to retain a larger portion of the

economic growth occurring within the local region. For example, sales and income taxes grow based on the inherent vitality of a broad tax base, and they also capture the effects of inflation, which are reflected in incomes earned or the final price of goods and services sold. A critically important fiscal consideration is how better revenue growth not only expands the amount of funds available for pay-as-you-go infrastructure, but how it can fund additional borrowings to increase the amount of infrastructure investment. In the US, the wide variety of bonds and the higher level borrowing is supported by more extensive taxing powers. That taxing power provides the scope to take on more debt and make more infrastructure investments than their Canadian counterparts (Estache 1995).

Demographically, a more diverse set of taxes would enable cities to better cope with the rapid pace of urbanization, compensate for current patterns of population growth, and deal with urban sprawl. Rapid population growth increases the demand for more services, stresses existing infrastructure systems, and creates pressure for new infrastructure. A growing population is not ordinarily problematic for governments—it leads to economic growth and increased tax revenues. But cities are highly dependent on the property tax, which does not always capture the increased tax revenue that normally accrues from a growing population and an expanding economy. Tax diversity would allow cities to better accommodate growth through tax revenues generated by that growth.

More important is the pattern of urban population growth, much of which now occurs in metro-adjacent areas. This donut growth or urban fragmentation meets up with a lack of diversity in municipal tax tools to severely press city finances—the burden of sustaining municipal services and the underlying infrastructure lands squarely on local taxpayers as opposed to those who use the services and infrastructure. While peripheral growth does stimulate the local economy, this does not always translate into additional property tax revenue, particularly as far as the residential property tax is concerned. In the absence of sufficient federal and provincial grants to offset such concerns with free-riding and fiscal disequivalence, there are only two options remaining. First, a city-region can be amalgamated. But amalgamation involves a loss of local control, it can bid up the costs of municipal services, and it also stifles the impulse for creativity and

competition between various municipalities in a city-region. A second, and much more creative option, is to allow cities a more diverse tax system that enables them to equalize those externalities themselves.

Canada's big cities also continue to struggle with the effects of urban sprawl, which increases the cost of providing services and leads to higher demand for municipal infrastructure such as roadways and transit. The drivers of urban sprawl are many, but one factor that is often ignored is the role the property tax may be playing (Slack 2002b). Residential properties closer to the city core are usually more expensive and carry higher assessed values. Thus, they carry higher effective rates of property taxation than similar properties in the suburbs. At the same time, the costs of providing municipal services and infrastructure to suburban properties are arguably higher (Vander Ploeg 2004a). This has led to a system of cross-subsidization where those living close-in are covering the costs for those living far-out. All of this reinforces sprawl. Lower property taxes combined with other forms of taxation may allow such issues of cross-subsidization to be better managed.

Issues of governance also provide part of the overall rationale. Just as cities have grown in size, importance, and complexity, so have the issues with which they must contend. Many of these new responsibilities are directed toward people services as opposed to property services. Today, municipal governments are responsible for a number of non-traditional functions that possess a strong social element (e.g., immigrants and issues of immigration settlement, drug abuse, crime) or possess clear income redistributive qualities (e.g., poverty mitigation, community social services, urban Aboriginals, homelessness, affordable housing). At the same time, there exists a mismatch between these newer forms of municipal expenditure and the type of tax cities have at their disposal. The property tax is ill-suited to address services to people that may also require a redistribution of income because the property tax base is very narrow. Social issues unrelated to property services are better handled by other forms of taxation with a broader tax base, whether that is the personal or corporate income tax or a broad-based general sales tax.

Increased tax diversity at the local level provides an opportunity to better match revenue-raising capacity with current municipal expenditure responsibilities, and would

allow infrastructure to better compete for scarce property tax dollars. All the benefits of the evolving expertise of big cities and their proximity to these issues are retained at the same time that their current responsibilities are better squared with appropriate financial resources. Given the interconnectedness of governments today, disentanglement is not an option. Neither can cities unilaterally withdraw from these areas of responsibility. As such, a new fiscal framework remains one of the only viable alternatives.

Economically, the current administration of the property tax cross-subsidizes service and infrastructure, leading to inefficiencies, waste, and artificially increased demands for more services and infrastructure. In many ways, the property tax also makes less sense in the new economy. No longer is property a key to creating wealth or income. Evidence of this comes from many cities that are reporting a declining commercial and industrial property tax base. In the new globalized information economy, new systems of taxation need to be considered if cities are to fund a high quality package of infrastructure and services that can attract and retain the highly skilled labour necessary for local, provincial, regional, and national economic success.

At the heart of the matter is how Canada's municipal tax distinctiveness may constitute a competitive disadvantage. It is important to recognize the competitive benefits that accrue from a diversity of tax tools and revenue levers. No single tax is entirely fair or neutral with regards to investment patterns, economic distortions, or decisions about location and business inputs. Nor is every tax equally suited to generating predictable, stable and growing streams of revenue. No single tax source is equally suited to compensating for inflation, capturing growth in the local economy, or controlling for the problems with free-riding and fiscal disequivalence that inevitably result from more and more people filling the beltways around our cities. In short, the infrastructure challenge constitutes a powerful argument for employing a range of local tax tools and revenue levers, where the advantages of the property tax can be retained at the same time that its disadvantages are offset by the presence of other taxes (Kitchen 2000). In many ways, it is simply unreasonable to expect one tax alone to carry the burden of funding today's modern cities. In many ways, a more diverse tax system directly addresses some of the most important drivers of infrastructure deficits and debt.

Politically, a more diverse tax system provides the opportunity to establish better accountability. More direct control to generate revenues would provide cities with more accountability to citizens, and increase the public's confidence that the dollars will be well spent. Only locally raised taxes and locally decided government expenditures can ensure the highest level of accountability. To fund infrastructure, cities currently rely on the property tax and funds granted by the provinces and the federal government. In the exchange, accountability is reduced. To the extent possible, locally decided expenditures should be recovered through locally generated tax revenues, and this requires a re-jigging of the municipal tax system.

Disadvantages

Allowing cities access to other taxes could create new and unwanted distortions. The non-neutralities of local sales and income taxes can be quite significant, and some argue they are inappropriate at the local level (McCready 1984). For example, if a city decides to levy its own local general sales tax, this could stimulate a shift in consumption patterns as shopping gravitates to non-taxing jurisdictions. A locally imposed personal or corporate income tax could lead to the same exodus. For example, a 3% personal income tax in New York City was blamed by some for providing firms with the stimulus to move their operations across the river to New Jersey (Tullock 1994). New tax tools would allow cities to experiment and compete with a range of taxes, as well as different levels of taxation. But the existence of competing jurisdictions down the road makes this difficult. Because such taxes can be easily avoided, cities might be compelled to move back to the property tax simply because of the immobility of the tax base. Obviously, this would be self-defeating.

Such problems can be overcome if the taxes are synchronized across a city-region with minimal tax rate differentials. But such alignment may not be easy to achieve. Another solution is for these taxes to be levied province-wide with the revenue rebated to cities. This follows the basic approach used in many US and European cities. While this would overcome some of the distortions, it could also lead to problems with accountability.

Personal and corporate income taxes, general retail sales taxes, and selective sales taxes are more elastic taxes. As a result, they are more vulnerable to the ups and downs of

the economy. Cities that are heavily reliant on these types of taxes could find themselves with severe revenue shortfalls during an economic downturn. As such, these taxes should only be seen as a supplement to the property tax rather than a wholesale replacement of it.

In many ways, increased tax diversity is more relevant for larger cities than smaller cities and towns. The number of people concentrated in larger cities provides a critical mass for using new taxes. Smaller cities may lack this critical mass, and may also lack a large enough tax base. For smaller towns and cities, new taxes would have to be levied province-wide and remitted based on some formula that equalizes the revenues based on per capita considerations as opposed to point of sale. This more closely approximates a grant that is tied to a specific tax. Also, new taxing authority is not intended to provide better revenue generating capacity only—it is also about achieving other policy objectives. For example, it is in bigger cities where new tax tools help answer a growing fiscal disequivalence problem brought on by a donut growth pattern. Smaller and medium-sized centres do not always offer the same types of services and infrastructure as the larger cities. Smaller centres also have a lower level of expectation for the same type of services (e.g., busing versus light rail transit). Neither do smaller cities and towns share the same large scale social issues facing bigger cities.

Winning Conditions and Applications

In considering the conditions and applications of new local taxes, the focus needs to remain on three considerations. First, how can new taxing authority best be implemented? Second, what are the most important criteria that cities should consider when selecting new taxes and administering them? Third, what are the range of taxing options available, how do they work, and to what infrastructure are they typically applied?

In terms of implementation, there are three broad approaches open. First, cities can simply be provided the authority to levy a range of new taxes. This approach has the advantage in that it is easy to frame and understand. The downside is that it implies an increase in effective taxation. There are reasons why an increase in municipal taxation may be warranted. The existence of sizeable municipal infrastructure deficits will not be eliminated without taxpayers at some point picking up the cost, and current municipal tax loads as a percentage of GDP and personal disposable income are significantly lower than

they were a decade or two ago (Vander Ploeg 2004b). Thus, a modest increase in taxation may simply restore municipal tax revenues to historical levels.

Second, the federal and/or provincial governments could transfer some tax room to cities, avoiding an increase in overall taxation. This approach recognizes that the tax structure in place for Canada's cities may place them at a competitive disadvantage, but a higher effective tax burden may not be the appropriate response. To avoid this, many urban finance analysts argue for a shifting of taxes between the federal, provincial, and municipal governments. While this approach avoids the thorny problem of a tax increase, movement here is limited. The federal government is under constant pressure to increase provincial transfers for health and education, and debt repayment and tax relief remain on the policy agenda. Many provincial budgets are already stressed, with some teetering on the verge of a deficit. In the end, the competition for scarce tax dollars is fierce, and this limits the potential for a substantial shift in tax room between the three orders of government.

Third, cities can sidestep objections over a tax increase and pressuring the budgets of other governments by sacrificing a small amount of revenue now as an investment toward better tax tools in the future. For example, cities could commit to a significant one-time reduction in the property taxes they collect. That could then stimulate the start of negotiations to secure agreement for new taxing authority. To ensure a win-win for taxpayers, the province, and the cities, the tax swap should be revenue neutral in the short-term.

However, even more traction would occur if the tax swap were to act as a short-term tax cut—if the new tax revenues did not make up the entire difference in foregone property tax revenue. This short-term revenue loss in the operating budget could be absorbed by reducing the amount of pay-as-you-go dollars transferred to capital. Because many Canadian cities currently have relatively low amounts of tax supported debt, some modest borrowing in the short-term could be taken on to support infrastructure until the revenue generated by the new tax tools closes the gap across the long-term. With this approach, cities would be offering taxpayers, as well as the province, the potential for a reduced tax load. Such a scenario ultimately results in a win-win for everybody. Although the approach does not address the short-term and immediate

fiscal needs of the cities, it does offer the prospect of a much more sustainable future for infrastructure. In the end, no policy choice is ever free—all come without at least some cost. Cities need to recognize this as well.

The advantages and disadvantages of a tax are a function of several criteria that include effectiveness, efficiency, equity, transparency, visibility, accountability, reliability, and administrative simplicity. No two taxes ever measure the same across these variables. As such, careful consideration should be given to how well various taxes perform against these criteria. Such exercises can be found in any standard economic text, and need not concern this study. However, it is beneficial to consider three other broad thoughts concerning the expansion of municipal taxing authority.

First, any move to provide new municipal taxes should focus attention squarely on user or benefit taxes. These taxes are not necessarily paid by all citizens equally, but are indirectly related to how much infrastructure or services are consumed. For example, the amount of fuel tax paid by an individual is directly related to how much driving that individual does, and indirectly, to how much municipal infrastructure is consumed during the course of that driving. User or benefit taxes are some of the most efficient and equitable taxes available, essentially acting as a proxy for the more direct user fee.

Second, taxes that have the rate expressed as a percentage of the total price are more beneficial over the long-term than static taxes that have the rate expressed as a fixed dollar amount per unit purchased. The latter tax has revenues growing only in proportion to the volume purchased, while the former produces revenue that also keeps pace with increases in price. For example, inflation will continually eat into a \$10 tax on hotel rooms, but a 10% tax will always keep pace with any increase in price.

Third, the same principles that apply to increasing property taxes also apply in terms of new tax tools. In other words, cities should seek voter approval for new taxes, the tax rates should be capped, and the revenues should be earmarked for capital purposes in general, select types of infrastructure, or specific infrastructure projects. All taxes should be subject to a sunset clause as well. New taxes could also be accompanied with regular audits and public reporting on how the tax revenue has been used. All of this will increase

accountability, ensure a measure of democratic participation, and increase the likelihood of voter approval and taxpayer acceptance of new taxing measures.

With that said, cities around the world use a variety of direct and indirect taxes, broadly grouped into eight categories, with several kinds of taxes that can be listed under each category. It is important to stress that no one city uses all of these taxes—it is simply a laundry list from which cities can choose.

Property Taxes

There are three basic types of property tax used in Canada. The general property tax is a levy on the entire assessed value of residential, commercial, and industrial property in a city. A business tax is a special levy based either on assessed value or some other measure such as the annual rental value of a business property. Both of these taxes produce revenues that are discretionary. Local improvement levies are applied only to specific properties benefiting from a local capital improvement. But these three are not the only types of property taxes that can be used. There are five other types of property tax that can be used, and some may help with the funding of infrastructure.

Special Capital Levy on the General Property Tax: Like the general property tax, special levies are a uniform tax applied to all properties in a city. However, the revenues are earmarked for a distinct purpose. With regards to infrastructure, some cities employ a special capital levy—a surcharge on the general property tax bill. This levy is usually expressed as a percentage of the total general property tax owing. Such levies can be instituted for a specified time or continue indefinitely. The surcharge is usually earmarked for general capital or is dedicated to a specific infrastructure purpose such as transit or street repair. Special capital levies can also be used for a specific infrastructure project. Because they are earmarked, special capital levies are more transparent and therefore more acceptable to the public. In many ways, special levies are not a new or alternative funding mechanism—they do not dramatically diverge from standard Canadian practice. However, they could be used more frequently. The City of Ottawa recently proposed a 1% capital surcharge on its total property tax bill, as well as another 1% capital surcharge on municipal utility bills.

Differential Property Taxation: Special area property taxes are imposed on specific areas—not properties—which enjoy a particular local infrastructure or enhanced service. The concept of differential taxation expands on this type of property tax by envisioning a tax premium on properties in certain areas because of the higher costs of providing infrastructure and services to those properties. General property taxes are assessed based on property type and assessed value, and do not vary based on the costs of delivering services or providing infrastructure. If properties are assessed at market value and taxed uniformly, then properties at the centre of a city will generally pay relatively more tax than those in the outlying areas because of their higher assessed value. Since the costs of services is relatively lower in the central areas, the result is that properties there are overcharged while properties in the outlying areas are undercharged. Thus, the property tax may discourage development in the central areas and encourage peripheral development—sprawl—which increases the costs of municipal services and requires more infrastructure.

To reduce urban sprawl and promote urban density, differential taxation would apply a special area tax on suburban properties or use a set of cascading taxes that gradually increase as one moves away from the city centre toward the periphery. At issue here is the realization that those who enjoy the benefits of urban sprawl do not always pay the costs associated with it. The original costs of infrastructure can be captured by development cost charges (DCCs). But development fees do not generally cover the additional costs of operating the infrastructure or maintaining and eventually replacing it—that must come from the general property tax. Differential taxation has two benefits—it ensures more fiscal equity and also promotes more sustainable land use decisions.

Such an approach could be immensely unpopular politically, and these taxes may not even be allowed under provincial legislation. There would also be difficulties in arriving at some quantifiable method of applying such taxes so that they actually reflect the variable costs that they are trying to capture. But the essential point remains—if the incentives inherent in the property tax are part of the problem, then measures must be devised that offer the potential to reverse some of those incentives. If the incentives and drivers are not addressed, one has not tackled the source of the problem.

The concept of differential property taxation can come in other forms as well, such as targeted property tax abatements for certain properties in certain areas. At another level, differential taxation can also amount to a type of property tax reform. For example, distortions in the property tax system could be removed by eliminating the over-taxation of multi-family dwellings and commercial properties relative to single-family homes. This would eliminate some of the cross-subsidization of services and infrastructure that currently occurs, and may also result in higher urban densities.

Numerous references to the idea of differential taxation exist under various labels and forms, but hard examples are relatively difficult to come by. However, the City of Austin, Texas provides an interesting example. The City has decided to include a special transportation levy on all municipal utility bills. The levy is described as a user fee but it is more properly a tax. The levy averages \$30-\$40 annually for the typical household, but the charge is based on the estimated average number of daily trips made by individuals residing in different types of property. For example, a single-family housing development is estimated to generate 40 trips per acre per day, while other types of properties generate fewer trips per day and are charged less (Victoria Transport Policy Institute 2005).

One study exploring property taxation in the greater Toronto area acknowledges that residential properties tend to be more valuable in the central urban core than in the periphery, but properties on the periphery are also taxed more heavily. This situation—residential properties in the centre with higher values but lower tax rates—means that residential properties in central areas are likely paying relatively less tax for relatively lower cost services and infrastructure, while outlying properties in lower density areas are paying relatively more tax for relatively more expensive services and infrastructure. It is this type of dynamic that differential taxation seeks to promote. The approach limits cross-subsidization and urban sprawl, and lowers the need for municipal infrastructure investment.

Property Tax on Personal Property: Most property taxes target real property—land and improvements on that land. Another form of property tax is the taxation of various items of personal or business property. For example, some US and European cities levy an annual property tax on

the value of personal and business motor vehicles. These taxes are levied and collected during the annual vehicle registration process. This type of taxation is not generally known in Canada, although some municipalities have in the past taxed certain items of business property, particularly various types of commercial and industrial equipment. The taxation of personal property—particularly vehicles—tends to have low collection and administration costs. The tax is also quite progressive since it is based on the value of vehicles, which often correlates positively to household income. A distinct advantage is how such taxes link to transportation infrastructure, and how they respond to the overall state of the economy—revenues from the tax will increase as the value and volume of vehicles increase. However, the tax has a relatively small base and can only generate a limited amount of revenue. Further, it will be local residents who bear much of the burden since the tax cannot generally capture revenue from those outside the taxing jurisdiction (Atlanta Regional Commission 2003).

Land Value Capture or Land Value Uplift Taxes: Land value capture (LVC) taxes are another type of special property levy. The basic premise of the tax is to capture a portion of the increased value that accrues to various land owners when a large infrastructure improvement is constructed in close proximity to their property. Thus, the base for a land value capture tax is an increase in property values arising from public infrastructure development. The funds captured by the tax are then used to fund the infrastructure provided. Land value capture taxes are sometimes called land value uplift taxes, land value increment taxes, valorization taxes, or capital value charges.

When a large infrastructure project is constructed, it often results in higher land values for properties within a certain zone of influence or benefit zone. The increase in value is not due to the effort of property owners—it accrues only from the infrastructure provided. This value uplift results from increased desirability of the location, better access, and the potential for higher rents, increased resale value, or higher density development. Zoning changes that accompany the infrastructure improvement may also increase property values.

Land value capture taxes can be either unilaterally imposed or take the form of a negotiated agreement. The tax can be

levied as an ongoing annual charge or as a one-time tax. The tax is usually levied according to property type and its location in the zone of influence—properties closer to the infrastructure are charged more while properties further away are charged less. Another way cities have captured value uplift is through the increased commercial revenue generated by properties abutting a new infrastructure (Slack 2002a). Yet another form of LVC is joint development value capture. Here, a government acquires land for a new infrastructure facility, leases that land to private developers, and then uses the proceeds to fund the infrastructure improvement.

The terminology and language surrounding land value capture taxes is confusing. Sometimes, LVC is equated to local improvement levies and betterment taxes, development cost charges (DCCs), density bonusing, and tax incremental financing. In some ways, these tools are a form of land value capture, but they are still different. For example, local improvement levies speak to small infrastructure enhancements while LVC usually involves one large infrastructure project. DCCs do not act as a tax proper, but function more like a user fee. DCCs are levied based on the cost of infrastructure rather than an increase in property values. Further, DCCs apply only to new development while LVC can be applied to a new development, re-development, or an existing development. Density bonusing collects extra revenue from property owners in exchange for a change in zoning that will allow for more compact development. It applies to new developments only. Tax incremental financing also differs from the traditional land value capture tax. TIF is generally used to fund a variety of infrastructure across a pre-determined area, while LVC taxes are often used for one major infrastructure improvement.

The LVC tax is often defended as being a fair tax. It is simply unreasonable, the argument goes, for private landowners to realize a substantial financial gain from a public investment without the private sector contributing or taking any risk. The tax also encourages the more intensive use of land by making it less profitable to hold for speculative purposes (Slack 2002a). The tax often has the ancillary benefit of concentrating population densities in a way that makes public transit more viable.

However, the tax also raises a number of questions and difficulties. How does one measure the incremental increase in value that accrues from the construction of infrastructure?

Property values can increase for many reasons, such as falling interest rates. Annual reassessments and market value assessments make an increase in value easy to determine, but what portion of the increase can be directly attributed to the new infrastructure? How can governments separate the benefits among the various properties in the zone of influence? When do you implement the tax? Timing is a big issue since property values can increase in several stages. Some property values may increase the moment a new project is announced, others during construction and others only years after construction has been completed. While the tax can be conceived as being fair, some property owners may not realize an increase in value until they sell the property. (Slack 2002a). In the meantime, the tax can be quite burdensome and even force the sale of property

In the end, LVC taxes may not have much to offer given recent changes in assessment practices. Many cities in Canada have moved to a system of annual market value assessment, which largely captures increases in property value that might occur from public infrastructure investment. Only with infrequent reassessments may LVC have much to offer—the tool is quite dependent on current practices surrounding the general property tax.

Underlying LVC is a basic assumption—that infrastructure increases property values. This is not always the case. The impact of infrastructure on land values is sometimes positive, sometimes neutral, and sometimes negative. Many times, it is simply uncertain. Recent studies in the UK have explored cases where the expected increase in property values did not materialize. The idea of taxing increasing property values arising from infrastructure investment is appealing, but there must be an established link between a change in property values and the infrastructure. Even where a link exists, the relative change has to be measured and a determination made with respect to causality within a defined benefit area. All of these are problematic, particularly if benefits occur across a wide area. As such, the applicability of LVC depends on the particular infrastructure in view. A new multi-use recreational centre may increase local property values while a new arterial road may reduce property values because of noise, air pollution, increased traffic and general disruption in the neighbourhood (Gihring and Smith 2004).

As a result, LVC taxes are most often used to fund new investments in transit infrastructure, particularly large projects such as an extension of LRT service, the construction of new transit stations, and subway extension. LVC taxes have also been used for highways and new interchanges, as well as schools, parks, and conservation areas. However, these applications are less common. Transit infrastructure tends to provide a good fit with LVC. Transit improves accessibility to various properties and makes higher density development more practical. Both of these factors increase the value of properties adjacent to major transit infrastructure.

LVC is quite rare in Canada, although a form of the tax was used to fund the Lion's Gate Bridge in Vancouver. In Brampton, a large office complex built over a local bus and GO transit terminal—the Brampton Gateway Terminal and Executive Centre—was partially funded through a form of LVC. Land value capture taxes are more common in the US, Europe, Japan, and among the Asian Tigers—Singapore, Taiwan, and Hong Kong. All of these jurisdictions tend to have more developed public transit systems and highly concentrated populations. For example, Hong Kong raised \$5 billion (HKD) through LVC to help fund the \$7 billion cost of a new transit line. This was accomplished by taxing the profits on property development occurring around stations along the new route. Hong Kong's rail transit system receives no subsidy. All costs and interest on bonds used to finance construction are paid from taxes on land close to the new transit infrastructure (Gihring and Smith 2004).

Site Value Taxation: The idea behind site value taxation (SVT) or a land tax is to remove the property tax from all improvements and tax only the value of the land portion of residential or business property. This idea represents a fundamental departure from current practice, which taxes both the value of land and improvements equally. The compromise position between the two is the split-rate tax, two-tiered property tax, or the differential mill rate tax. Split-rate taxation taxes the land portion of property at a higher rate than the improvements sitting upon the land. According to its proponents, site value taxation removes many of the negative distortions currently produced by the general property tax. For example, when land and improvements are taxed equally, there is little incentive to make improvements to underdeveloped or under-utilized land. Such systems of taxation create low holding costs for land, encourage speculation, and push development out to the urban fringe.

However, when land is taxed at a higher rate than the improvements sitting on top of it, the relative cost of holding vacant or under-utilized land will rise. To lower their tax liability, owners will make improvements. This happens because those with significant improvements on their land pay the least amount of tax relative to the total value of both the land and improvements they own, while those holding vacant or under-used land pay more. In other words, site value taxation favours the highest and most intensive use of land to lower the relative amount of tax paid. In theory, site value taxation is said to encourage more dense development and also promote inner city revitalization—property owners can improve their properties without having to pay more tax. Taxing land moves the property tax burden away from investment and toward the development of unproductive, vacant or under-utilized property. It motivates owners to convert property to its best and highest use (Holle and Owens 2002). In a sense, site value taxation acts much like a user fee for access to a limited natural resource (Hartzok 1997).

Site value taxation is a simpler form of property tax that would be less expensive to administer. Because assessment would exclude improvements and focus on the market value of land, a more objective property tax system results. In addition, property tax increases created through creative reassessments become more difficult (Holle and Owens 2002). Most importantly, to the extent that site value taxation reduces urban sprawl, encourages densification, and promotes inner city redevelopment, it also allows for the use of existing infrastructure and reduces the need to build new infrastructure.

At the same time, several notes of caution need to be made. Under systems of site value taxation, an accurate assessment of the real market value of the land component is critical (Holle and Owens 2002). If this does not occur, the benefits of the tax may be lost. Because site value taxation promotes intensification of land use, some argue it also results in difficulty with preserving open space and parkland in the urban environment. Site value taxation may require both better and more stringent municipal planning and various regulations to preserve open space.

With respect to infrastructure, the single biggest question is how site value taxation affects development patterns. The literature is not unanimous on this question. Some argue

that site value taxation will simply speed up all types of development regardless of location. Others suggest it will speed up development in the urban fringe where land values are lower, particularly in areas with available farmland. All of this goes against the various proponents of site value taxation, who argue for a clear connection between the tax and a lower incidence of urban sprawl.

Site value taxation is not completely unknown in Canada. In the early 1900s, it was common among municipalities in the western provinces. To this day, some municipalities still tax land at a higher rate than improvements, but the extent of the practice is not known. Site value taxation and split-rate taxes have been used in cities around the world, including Johannesburg, Sydney, Melbourne, Wellington, as well as cities in Denmark and Israel. In Denmark, site value taxation has been working successfully for about 80 years. In the residential sector, the rate of taxation averages 2% of land value with an annual 1% tax on the market value of the home.

While the practice is not widespread in the US, the state of Pennsylvania is a notable exception. Across the state, 15 cities are using, or have used, a form of split-rate taxation. The experience of cities in Pennsylvania provides a tighter link between the theory of split-rate taxation and the results on the ground (see the sidebar discussion). Split-rate taxation has been credited with limiting urban sprawl, encouraging infill development, and revitalizing downtown areas. With more and more positive evidence beginning to emerge, any move to a straight site value tax, or a split-rate tax heavily tilted toward taxing land, becomes a less dangerous enterprise, even though it involves a major shift in municipal tax policy.

Other Local Real Estate Taxes

Ad valorem taxes based on the assessed value of property are not the only types of real estate taxes open to cities. There are four other real estate based taxes that may offer some potential when it comes to funding infrastructure.

Real Estate Transfer Tax: Revenue derived from a real estate transfer tax (RETT) comes from a percentage tax rate applied to the gross value of certain real estate transactions. In many ways, RETT mimics a selective sales tax, but the tax base is not always the purchase price. For example, a variant of the RETT is a deed tax or mortgage tax. When a mortgage

Land Value Capture: Two US Studies

Cities need to find new ways of funding transportation capital investment, particularly for public transit. Land value capture taxation may offer a relatively painless means of achieving this goal. The tax may also have the ancillary benefit of concentrating population densities in a way that makes public transit more viable.

The January 2001 edition of the *American Journal of Economics and Sociology* contains a case study of how land value capture taxation could have been used to finance a portion of New York State's interstate highway system. The Northway is a 9-mile stretch of I-87 constructed in the late 1950s. The Northway is the most heavily traveled section on the 178-mile road. The purchase of right of way and initial construction costs of the Northway were \$128 million when it was constructed. However, the additional land value generated on account of the roadway—land running two miles on either side—is estimated to be \$3.7 billion since construction was completed. The capital financing of the Northway could have been accomplished by capturing some of these windfall gains that fell to private landowners in the area. The added value of the adjacent property was a direct result of the public investment made, and a portion could have been returned to the public to pay off the bonds issued to build the Northway.

In 1992, a study was conducted on the impact of San Diego trolley stations upon nearby property values. The study concludes that monthly rents for retail establishments located adjacent to trolley stations were, on average, 167% higher than the rents collected for various properties just a half block away. The higher rents were largely due to the amount of increased pedestrian volume. Increased property values were also experienced by some residential properties.

Sources: Batt 2001 and Cervero 2002.

is signed and the deed to the property is registered, a city applies a tax on the registered amount of the principle portion of the mortgage.

Real estate transfer taxes can act as a complement to the existing general property tax, but with fewer complications. The tax base is more easily quantified because it rests on price rather than some notion of assessment. Depending on the strength of the local real estate market, the tax base can

also be very robust—a small tax rate can generate significant sums. Another advantage of the RETT and various mortgage taxes is how they treat older homes and newer homes on an equal basis.

At the same time, the tax may result in higher home prices, reduced profits for builders and real estate agents, and even lower wages in the construction industry. The tax is also a one-time levy, paid only when real estate changes hands. A significant disadvantage of the tax is simply the size of the amounts involved. A 1.0% RETT on modest home worth \$150,000 would cost a taxpayer \$1,500. However, some of these disadvantages may be offset by properly tailoring the tax. For example, the first \$100,000 of a home could be made exempt from the tax, converting it into a luxury tax targeting high-end homes. This lessens the regressivity associated with the tax and still allows first time home buyers access to the market.

Locally levied RETT taxes are quite common in the US. But neither are they unknown in Canada. Municipalities in Nova Scotia and Quebec have the authority to levy real estate transfer taxes on the full value of transferred property. Currently, about one-third of all Nova Scotia municipalities levy a RETT, with rates ranging from 0.5% to 1.0% of the value of real estate transactions. Quebec municipalities can levy a land transfer tax at the rate of 3/10 of 1% on the first \$50,000 of the sale price and 6/10 of 1% on the remainder.

Development Tax: Development taxes target new residential and commercial construction occurring in suburban green-field areas. The standard development tax is not an *ad valorem* tax based on the assessed value of property. Rather, it is a fixed dollar amount applied to each new unit of housing or commercial space that is being developed. Sometimes, it takes the form of an occupation tax placed on businesses involved in real estate development, or an occupation tax that comes due when a person or business moves into a new housing or commercial property.

Such taxes are often confused with development cost charges (DCCs) or various development exaction fees and impact fees. However, the latter are more properly a user fee designed to recoup the costs of providing new infrastructure and are earmarked for that purpose. Development taxes, on the other hand, are primarily employed as a general revenue-

Split-Rate Taxation: The Pennsylvania Experience

Pittsburgh: Split-rate taxation in Pittsburgh dates back to 1913. At one point, the the split-rate tax concept was expanded to the point where land values were taxed at a rate six times the rate applied to improvements. As a result, some say Pittsburgh has a much more compact development pattern than other comparable US cities. One research study compared the average annual value of building permits issued by Pittsburgh in the decades before and after the tax change. The results show a 70.4% increase in the value of building permits issued after the tax change. This was remarkable in light of the fact that Pittsburgh's basic industry—steel—was undergoing a severe crisis at the time.

Harrisburg: In 1974, Pennsylvania's capital city started taxing land values at a higher rate than buildings. Today, Harrisburg taxes land values at a rate three times that of building values. The change resulted in a doubling of the number of building permits issued. The number of vacant buildings has been reduced from 4,200 in 1982 to less than 500 today. Since the early 1980s, the tax change is also being credited with a 23% drop in the overall crime rate and a 51% drop in the fire rate.

Allentown: In 1996, residents in Allentown adopted a split-rate tax system. Prior to the change, residential and commercial construction had been in rapid decline. Since 1996, however, the value of new business construction rose from less than \$1 million to almost \$18 million by 2000. The value of new housing increased fourfold, from just under \$3 million in 1995 to over \$11 million in 2000.

Sources: Holle and Owens 2002 and Hartzok 1997

raising device. Unlike development cost charges, they are not used to shape or regulate new developments. Development taxes are typically applied uniformly across a city, and the revenue raised is used to support both operating and capital expenditures.

Development taxes are a simple way to gain revenue from new developments. They also offer more flexibility than the standard development cost charge. As a user tax they are more efficient than a general property tax increase, but they are less efficient than a development cost charge. As a result, development taxes should only be used when there

is inadequate data or other resources to develop a system of comprehensive development cost charges based on the user fee principle.

The confusion between development taxes and development cost charges makes it hard to gauge the usage of this tool. One possible example of a development tax might come from the City of Calgary, which passed a new development tax in April 2006. The new levy negotiated between the City and the local development industry, will be used to pay for recreational centres, libraries, transit, and emergency services in new communities. The levy will be charged to residential and commercial developers, who will pay about \$40,000 for each hectare of land developed. While the final cost to the end user depends on how many units are built on a hectare, the levy is estimated to increase the average cost of a lot by \$2,000 to \$2,500. The new charge is expected to raise \$176 million over five years (Platt 2006). Whether such a charge more closely approximates a development tax proper or a development cost charge is open to dispute since it includes elements often found in both.

Blight Taxes: Blight taxes are a special charge levied against the owners of abandoned properties or vacant and under-utilized land, and have been advanced as an innovative form of taxation to stimulate the redevelopment of inner city areas. The idea of levying a special tax on urban blight is very much related to recent debate over various smart growth strategies and the notion of intelligent or smart taxation. These strategies follow a relatively simple rule—tax heavily what you do not want and subsidize what you do want. To the extent that such taxes can spur inner city development, they allow cities to maximize some of their existing infrastructure capacity.

The purpose of a blight tax is to directly hit owners of abandoned inner city properties where it hurts the most—in their wallets. The hope is that this will drive owners to redevelop urban brown-fields or sell them off to someone who will. Blight taxes have a unique advantage as a tax—they are levied against unwanted behaviors at the same time as they provide funds for important local needs and priorities. Such taxes also have an environmental side—they encourage reuse rather than neglect.

The ability of blight taxes to stimulate redevelopment in the absence of other policy measures may be limited. While

urban brown-fields are marked by having accessible and usable infrastructure, they are not always redeveloped due to pollution and other environmental concerns, as well as various other legal constraints. In addition, the term blight is highly subjective. This makes it difficult to objectively levy such a tax. This is a recurring issue for the implementation of tax incremental financing as well.

Blight taxes can come in many different forms. For example, the state of Kentucky has legislation allowing cities to apply higher rates of property tax on the owners of large and abandoned properties. Other efforts use the reverse of a blight tax—providing tax incentives for brown-field redevelopment. Other cities have not implemented a specific blight tax, but are spending money to enforce current legislation. In the City of Detroit, a special 30 person unit in the prosecutor's office has identified 12,000 abandoned homes and are taking the owners to court for violating various municipal by-laws. As a result of stepped up enforcement, 1,290 homes have been renovated or are being renovated, and 880 have been demolished or are awaiting a similar fate. While many are still tied up in litigation, the office is also managing a list of 1,300 registered bidders waiting to buy properties that are being auctioned off to pay back taxes.

Parcel Taxation: A parcel property tax is a flat tax levied on real property that is voter approved and earmarked for a specific purpose. Parcel taxes are capped at a pre-determined rate and also expire after a certain period of time has elapsed. Parcel taxes carry the same advantages and disadvantages as an earmarked property tax.

Parcel taxes can be found in various US counties and cities. Typically, they are used as a way to raise funds for soft expenses. Parcel taxes are often proposed by local school boards to fund various arts and sports programs, to upgrade computers, and purchase books. They are also used to upgrade various types of local infrastructure, particularly when there is a need to incorporate new technologies. Parcel taxation is specifically targeted to existing infrastructure—particularly to cover the needs of ongoing maintenance. The proceeds are deposited into a various reserve fund out of which expenditures are made.

Parcel taxes are common in California. In 2004, for example, Alameda County voters were asked to approve an extension of the Library Services Retention and Enhancement Act of 1994, which was a 10 year parcel tax. Voters were asked to increase the parcel tax to maintain library services and infrastructure, and to extend the term of the parcel tax to 2024. Voters overwhelmingly approved the tax.

General Retail Sales Taxes

Sales taxes derive revenue from a levy on the consumption of goods and services. The primary difference between the many types of sales taxes is a function of the basket of goods and services to which they apply. A general retail sales tax applies to a wide variety of goods and services, typically with few exemptions.

The key advantage of the general sales tax as a funding source is a direct link to economic growth through retail activity. A small local sales tax of 0.25% applied across a wide base can generate significant revenue, and as long as the economy and retail sales are growing, both the base and value of the sales tax increase. It is not necessary to increase a sales tax rate to receive steadily growing revenues. Sales taxes provide good revenue generating capacity and they always capture the effects of inflation. A specific advantage of the sales tax in the municipal context is the prospect of some relief from the spillovers generated by outsiders to a community. Because commuters, visitors, and tourists will likely spend at least a portion of their incomes in the city, a general retail sales tax captures a portion of that income to help cover the costs of providing them with services and infrastructure.

However, sales taxes are quite vulnerable during times of economic recession, and if they are not properly implemented, they can create distortions in the local economy by shifting consumption patterns or affecting business location decisions. There are ways to lessen potential distortions. A local general retail sales tax can be levied and harmonized across a city-region, the rate can be capped to prevent destructive tax competition, or the tax can be levied province-wide with the revenue remitted based on point of sale. Some local sales taxes exempt expensive items to reduce distortions. For example, the state of Tennessee has historically limited a local option sales tax to the first \$1,600 of value for a single item. In 2002, the limit was raised to \$3,200. Thus, the state sales tax base is also larger than the local sales tax base.

General retail sales taxes are also accused of being a regressive tax. However, it is important to note that they are not alone in this regard. The property tax can also be regressive at low levels of income, and unlike sales taxes, they are not easily avoided—everybody has to live somewhere. Unlike property taxes, sales taxes can also be avoided by purchasing second hand. The degree of regressivity also depends on the tax base that is employed. In short, the regressivity of sales taxes can be managed. Since sales taxes target consumption as opposed to investment, the sales tax generally emerges as one of the least damaging taxes.

Across the globe, local governments in the US are among the heaviest users of the local general retail sales tax. The tax is often referred to as the one-penny tax, reflecting the most often used rate of 1¢ on the dollar or a 1% sales tax. To date, 33 states have authorized local general retail sales taxes at the county and municipal level for various forms of infrastructure. Only 15 states in the US do not allow some form of local retail sales tax. The rate of local sales taxation covers a wide range—anywhere from 0.125% to 7.0% (Schmidt 2000). Unlike their American counterparts, cities in Canada have only limited experience with locally levied general sales taxes. In 1935, Montreal introduced its own 2% local sales. Quebec City followed suit in 1940. Both of these taxes were assumed by the province in 1964 (see Vander Ploeg 2002a).

In many states, the local retail sales tax has become one of the only politically feasible methods of raising tax revenue. Throughout the 1970s and early 1980s, numerous state initiatives resulted in a capping of property taxes or made future increases subject to voter approval. Over the last two decades, US voters have shown themselves more willing to authorize a small county or municipal sales tax rather than a general property tax increase. However, local governments are not generally free to use the tax revenue as they wish. Most locally levied sales taxes in the US must be voter approved, and they have the tax rates capped by state legislation. Typically, the revenues are earmarked for specific operating or capital purposes.

In the US, general *ad valorem* property taxes still raise more overall revenue for local jurisdictions, but the general retail sales tax has become a very important tool for funding infrastructure. This is particularly the case for light rail transit systems, the rehabilitation of roadways, and the construction

of local schools. In some jurisdictions, local sales tax revenue has also been used for water sewer systems (Schmidt 2000). Like most broad-based taxes, a general retail sales tax is not a user tax. As such, it does not have a strong relationship to most forms of infrastructure. But analysts also concede that general retail sales taxes are quite appropriate as a funding source for infrastructure that serves a larger regional commercial and employment area. The sales tax helps large cities bear what is a disproportionate transportation burden (Gunaydin, London, Saltzman, and Skinner 2003).

Across the US, the local general retail sales tax comes in one of three basic forms. The basis of differentiation is the administration of the tax.

Local Option Sales Taxes (LOST): The local option sales tax or LOST is the most common form of general retail sales tax at the local level of government. LOST taxes are enabled by state legislation, which usually specifies that the imposition of the tax and any subsequent increase, be voter approved. Most states have a cap on the maximum rate that can be charged. While the revenues are typically earmarked, the taxes do not generally sunset. LOST taxes are implemented at the county level but the revenue is usually collected by the state and then remitted. In most states, various agreements exist between the county and municipalities to share LOST tax revenue. This tax-sharing is based on point of sale considerations or some formula is applied that sees the revenues equalized across municipalities based on population. Some tax-sharing agreements are a combination of the two. LOST tax revenue is used for a number of different operating and capital purposes. At the county level, it is often dedicated for roadways and transportation in general. In the cities, most of the revenue is used to support the operations and infrastructure of public transit.

Special Local Option Sales Taxes (SPLOST): This local retail sales tax is more restrictive than the standard LOST tax, and is generally reserved for local infrastructure or educational purposes. SPLOST taxes are imposed only with voter approval. The tax rate is set locally, but they are capped by state legislation. SPLOST revenues are usually earmarked for specific infrastructure projects, and the tax always expires after a certain period of time. The tax is generally levied at the county level, but a portion of the revenue is reserved for infrastructure projects in various municipalities across the

county. While SPLOST rates are usually capped at 1%, some states also allow local school boards to levy their own SPLOST in addition to the county SPLOST. In such cases, the maximum rate for any one county is 2%. SPLOST taxes typically sunset after a period of 5 years. To reinstate the tax, counties prepare a comprehensive capital plan that includes all proposed projects to be funded by the SPLOST. This is then submitted in a county-wide referendum. SPLOST taxes usually entail regular audits on the projects completed. SPLOST taxes have been used to fund roadways, bridges, tunnels, transit, parks and open space, libraries, flood protection, hospitals, and school construction.

Municipal Option Sales Taxes (MOST): Direct municipal option sales taxes levied at the city level are the least common form of local general retail sales tax. Most local sales taxes in the US are levied at the county level and then shared with municipalities. Given the success with voter approval for small local sales taxes and the range of infrastructure that it can fund, some US cities are calling for increased authority to levy their own sales taxes independent of the county. To date, these taxes remain relatively rare.

Selective Sales and Excise Taxes

A second set of consumption-based taxes are selective sales and excise taxes. Unlike a general retail sales tax, selective taxes do not apply to a broad basket of goods and services, but are targeted against certain items. These taxes can be expressed as a percentage of the total cost of a good or service (e.g., 7% on restaurant meals) or as a flat dollar amount per each unit of an item sold (e.g., 75¢ per each 750 ml bottle of wine sold). Selective sales taxes either apply to items that are exempted from a general sales tax, or they apply in addition to a general retail sales tax. As noted earlier, the former type of tax is more beneficial over the long-term since revenues will grow in proportion to both volume and increases in price. The latter tax may be subject to diminishing returns due to inflation. To protect the revenue, an increase in the tax rate may be required.

For cities in Canada, such taxes are generally limited to certain utilities such as gas and electricity, and various entertainment events. Local governments in the US employ these taxes as well, but also enjoy access to a wider range of selective sales taxes. Five types of local selective sales taxes appear to be the most common: 1) taxes on lodging and accommodations;

2) taxes on restaurant meals; 3) taxes on alcoholic beverages consumed in a restaurant, bar, or pub; 4) taxes on off-sales of alcohol; and 5) taxes on various gambling activities.

Such taxes are generally unknown in Canadian cities. However, Vancouver is a notable exception since it does levy its own 2% lodging and accommodations tax. The City of Winnipeg is one of the few cities in Canada that could theoretically expand its use of selective sales taxation. The Provincial-Municipal Tax-Sharing Act in Manitoba includes a provision allowing municipalities to levy a local selective sales tax on lodging and accommodations, restaurant meals, and taxes on alcoholic beverages consumed in public premises. However, these taxes also require provincial agreement. To date, no municipality in Manitoba has levied these taxes.

From an infrastructure funding perspective, the key strength of selective sales taxes is that they capture a portion of the economic activity generated primarily by outsiders. Taxes on lodging and restaurants, for example, focus on services disproportionately consumed by visitors. As a result, these taxes tend to be well received by local residents. In addition, selective sales taxes produce fewer distortions than a broadly based general retail sales tax because they apply to a limited range of goods and services—some of which are only available in a larger city. Such taxes are also relatively small compared to the overall costs incurred by most visitors. For example, a 5% tax on a \$150 hotel room for two nights amounts to only \$15. A 5% tax on six restaurant meals over the course of a weekend, with each averaging \$30, is only \$9. When compared to the total cost of a business trip or convention meeting, these taxes are relatively insignificant. Selective sales taxes are also easy to collect and administer.

At the same time, these taxes apply to a much narrower tax base, which means their ability to generate revenue is less powerful. These taxes are also vulnerable to the vagaries of the local economy since they tend to target luxury items. As such, selective sales taxes can only act as a supplement to a property tax or general retail sales tax.

The usage of this tax revenue differs between US cities. In some cases the tax revenue is unrestricted, in other cases it is earmarked for a specific purpose, and sometimes it is both. One of the advantages of these taxes is how they can be employed as a form of user tax to support certain operating

and capital expenditures. For example, selective sales taxes on lodging and accommodations are often earmarked to support tourism promotion and the operating and capital requirements of municipal convention centres. Selective sales taxes on gambling and the off-sales of alcohol can be earmarked to cover the costs associated with policing. In many US cities, selective sales taxes on entertainment, restaurants, and the consumption of alcohol in public premises are used to support municipal stadiums and recreational facilities. Such is the case in Seattle, where a 0.5% sales tax in King County was used to construct a new stadium.

Vehicle-Specific Sales and Excise Taxes

Vehicle-specific sales taxes are a special selective tax targeting motor vehicles. From an infrastructure perspective, these taxes require separate treatment since they relate to the single largest capital need facing cities—funding the rehabilitation and construction of urban road networks and public transit systems.

Local governments in Canada are not allowed to levy their own local vehicle-specific sales taxes. However, all municipalities in the country do receive a portion of the federal fuel tax through tax revenue sharing. Some cities and local or regional transportation authorities also have separate agreements with their respective provinces for provincial-municipal fuel tax revenue sharing. The situation of local governments in the US is much different. Across the US, a wide range of local vehicle-specific sales taxes are in play. These taxes include: 1) local option fuel tax or LOFT; 2) local vehicle sales tax; 3) local car rental tax; 4) local parking tax; and 5) local vehicle ownership or registration tax.

Vehicle-specific selective sales taxes are the classic case of a user tax. These taxes are paid only by those who own or drive vehicles and thus use public roadways. The benefit of user taxes is the link created between the use of infrastructure and the payment for that infrastructure. User or benefit taxation represents the middle ground between a direct user fee—which is not always possible—and other forms of taxation which are entirely unrelated to road usage (e.g., income taxes).

However, the full benefit offered by a user tax will materialize only when two conditions are fulfilled. First, the taxes have to be earmarked for the specific infrastructure to which they

relate. In Canada, this condition is only partially fulfilled. With the exception of recent federal and provincial fuel tax revenue sharing agreements with municipalities, most fuel tax ends up in general revenue. This is not the general practice in the US, where most state and local fuel and other motor vehicle taxes are earmarked for transportation infrastructure or transit (Atlanta Regional Commission 2003).

For example, the majority of US federal transportation grants received by state and local governments are generated from the federal fuel tax (18.4¢ per gallon on gas and 24.4¢ per gallon on diesel). These grants flow from the Federal Highway Trust Fund, established in 1956. The fund contains two accounts—the Highway Account and the Mass Transit Account. About 85% of federal fuel taxes collected flow into the highway account, and 15% into the transit account. In states where earmarking has been less prevalent, it is slowly coming into vogue. In 2002, for example, Proposition 42 in California was passed by 69.1% of those voting. This ballot initiative requires 80% of the 6% state fuel tax to be spent on state and local transportation infrastructure. Previously, the tax revenue was used for general revenue purposes.

Second, the user tax must be set at a level sufficient to cover the funding requirements of the infrastructure to which it is related. Across North America, this condition is not generally satisfied. It is generally conceded that federal, provincial/state, and local motor vehicle taxes have not been adopted at high enough levels to fund new transportation investments or maintain the existing infrastructure. Fuel taxes and other vehicle taxes only cover about 60% of the costs to build, improve, and repair roads, with the remainder coming from other tax sources. This has led other taxpayers to subsidize the cost of transportation, leading to over use, increased pollution, and other distorting effects.

Local Option Fuel Tax: For transportation infrastructure that must be funded through taxation, fuel taxes are the best and most logical choice. The base of the tax is quite large, and this allows significant revenue to be collected from a relatively small tax. Most important, fuel taxes are a first order user tax—the amount of fuel consumed directly relates to the amount of driving and roadway infrastructure used. In the US, 15 states have authorized the use of a local fuel tax (McGoun, O'Brien, Robey, Salak, Storey 2004).

But fuel taxes also have a number of downsides. Most fuel taxes are a static charge—the rate is fixed at a certain dollar amount per unit purchased. This means that the tax is unresponsive to inflation unless it is indexed and slowly rises over time. In the US, fuel tax rates have not generally been indexed, which has resulted in an erosion of the tax revenue relative to the expenditures it must fund. In addition, more vehicles are loading onto local roadways, but they are also more fuel efficient. Alternative fuel—methanol, ethanol, liquid petroleum, natural gas, propane, electricity—has also eroded the tax revenue. The result has been a shortage of funding to accommodate increased traffic and maintain the current road network.

In South Carolina, the total fuel tax revenues have increased over time due to increased volumes purchased, but since 1990 the revenue has only grown at about half the rate of growth in overall road construction costs. Fuel tax revenue, when adjusted for inflation, has actually decreased by 12% between 1990 and 2001. By 2003, the state estimated that the fuel tax was only 62% of its 1987 value (Gunaydin, London, Saltzman, and Skinner 2003). In California, the value of the state fuel tax revenue per vehicle miles traveled has been estimated to be only 36% of what drivers paid in 1970. In real terms, California's fuel tax has fallen by 50% between 1950 and 1998 (Dowall 2003). Given resistance to increased fuel taxation, 20 counties in the state are now using their LOST taxes to fill the gap. That has proven challenging as well, since the threshold for imposing this tax rose from a simple 50% majority to a two-thirds super majority in 1995 (Public Policy Institute of California 2005). In Kentucky, the fuel tax has fallen by 20% as a share of funding for state and local transportation infrastructure. In 1988, the tax funded about 52% of all state and local road expenditures. By 2000, it had fallen to 40%. As a result, some in the US are suggesting that fuel taxes should be levied as a percentage of the purchase price. However, there has been no movement yet in this direction.

Local Vehicle Sales Tax: Local governments can also collect revenue off the purchase of new and used vehicles. The rationale behind the tax is that part of the costs of transportation are simply a function of more vehicles loading onto roadways. Thus, an initial fixed tax per each vehicle sold is warranted. These taxes are best described as second order user tax since vehicle ownership is not an accurate proxy for actual roadway use. In the US, most of these taxes are

earmarked for transportation infrastructure. The benefits of the tax are again related to how it is levied. In South Carolina, for example, the tax is a percentage of the total sales price, but it is capped at a \$300 maximum. In 1984, that cap used to represent about 2.6% of the average new car price. Today, the ratio is about 1% of the new car price.

Local Car Rental Tax: The taxation of rental cars is seen as a relatively painless way to raise funds for local infrastructure without the burden being placed on local residents. The tax is usually justified as recouping the fixed costs of turning a whole fleet of cars onto a local roadway system and offsetting the incremental demand created by transient and temporary users. Most local car rental taxes are earmarked for transportation and transit purposes, and are placed on top of the state and local general retail sales tax, state car rental taxes, and other transaction charges.

Local Parking Tax: Local taxes on public parking sit between a first order and a second order user tax. The tax kicks in when vehicles move from one point to another, but the tax is not related to the distance travelled. This type of tax is quite common in both US and Europe, and taxes are used almost exclusively for transportation infrastructure and the needs of transit. In the UK, parking taxes at Heathrow, Stansted and Gatwick airports are dedicated to fund local transportation infrastructure around each airport. Revenues from city centre parking in Amsterdam are funding a new tramline. In France, parking taxes and fines have been earmarked for public transportation since 1973. A significant advantage of parking taxes is how cities can charge variable rates in certain areas to encourage more usage of transit and discourage vehicle usage in certain areas to reduce congestion.

Local Vehicle Ownership or Registration Tax: Many cities across the US levy wheel taxes on vehicle ownership. The form of this taxation varies—some are an *ad valorem* tax based on the value of vehicles, while others are fixed amount per vehicle. The tax is usually collected when vehicles are registered or license plate tags are renewed. Again, the tax is a second order tax unrelated to actual distance travelled or roadway infrastructure used. For the most part, these taxes are used to offset the costs of administration and record keeping, vehicle registration, inspections, and traffic enforcement. A key advantage of this tax is the ability to charge differential rates of taxation based on vehicle type. Some local governments

have special Road Damage Levies or Motor Carrier Taxes that charge higher rates of tax for larger vehicles that put more stress on roadway infrastructure.

Local vehicle-related taxes are a good tax option given their ability to raise dedicated revenues, and the financial incentives they can provide to use transportation efficiently. Around the world, new variants continue to emerge. As of 2003, for example, 6 US states have begun levying an environmental tax on top of their fuel tax. Rates currently range from 0.4 cents to 1.4 cents per gallon.

Income Taxes

The income tax is a direct tax that can be levied against both personal and corporate incomes, whether that income is generated through wages, self-employment, the proceeds of investment, the sale of property, capital gains, or corporate and personal business profits. In Canada, only the federal and provincial governments have the ability to levy direct taxes against income—local income taxes are completely unknown to local governments in Canada.

However, this is not the case for other cities around the world. In the US, 16 states have authorized local taxes on personal income. The state of New York allows cities with a population in excess of 1 million to impose their own personal income tax. Municipalities in Pennsylvania also have access to local income taxes. Across the state, local income taxes generate about 17% of all local government tax revenue (City of Toronto 2000). Both Louisville, Kentucky and Cincinnati, Ohio use municipal income taxes to finance public transportation.

However, it is primarily in Europe where local income taxes come into play. Municipalities in Germany have access to their own corporate income tax as well as a constitutionally protected share of 15% of all national personal income and wage tax revenues. Property taxes are relatively unimportant. The personal income tax is collected by state governments, which remit the revenue to municipalities based on point of origin. The City of Frankfurt levies its own special business tax on corporate profits. The tax base is determined by the national government, but the local government has the ability to set the tax rate. This tax alone accounts for two-thirds of Frankfurt's tax revenue (City of Toronto 2000). The City of Freiburg has also been able to share in the success of local businesses through a tax on company profits (Falk 2004).

Municipalities in Sweden also levy their own income tax. In Sweden, local income taxes account for roughly half of all local government local revenues. In Denmark, cities also have access to a local personal income tax. Each municipality sets its own rate and the tax is deducted at source. The tax is collected by the central government and then rebated to cities based on point of origin. Danish municipalities also receive 20% of all national corporate income tax revenue.

The primary advantage of the income tax relates to its sizeable base—incomes, wages, and corporate profits. This base is not only large, but it is very sensitive to economic growth—income taxes are one of the most elastic and responsive taxes available. Unlike the standard general retail sales tax, income taxes can also be structured to perform as a very progressive tax. On the downside, the elasticity of the tax means revenues can stall or even shrink during a recession. While the income tax is arguably better than a direct capital tax that targets investment, it is not as economically friendly as a sales tax, which targets consumption. Because income taxes result in lower disposable incomes, they are generally viewed as being quite detrimental to the economy.

From a municipal infrastructure perspective, income taxes raise a number of concerns. Like a general sales tax, an income tax is not a user pay tax but a general purpose tax. Local income taxes also create the possibility for significant economic distortions—encouraging business to leave the taxing jurisdiction and stimulating commercial and residential development outside the taxing area. In the Canadian context, such a move would require significant legislative amendment. Of even more concern is how a local income tax might aggravate what some analysts describe as an imbalance in the overall Canadian tax system. Governments in Canada tend to rely less on consumption-based sales taxes than their American and European counterparts, and adding another layer of income tax will only aggravate this imbalance.

The best usage of an income tax relates to the funding of government programs and expenditures that provide citizens with equality of opportunity and the redistribution of some national income to lower wealth disparities. As such, income taxes are most appropriate for funding social programs and arguably less defensible as a source of infrastructure funding. At the same time, there is no doubt that a small local income tax could generate significant sums for local governments.

The fact that other cities around the world use the income tax also suggests that the disadvantages of the tax can likely be tolerated under the right set of local conditions and circumstances.

Business Taxes

Local commercial and industrial properties are taxed at a higher rate than residential properties in most Canadian municipalities. Businesses can also be subject to additional taxes aside from the property tax. There are numerous reasons why this occurs. First, it is generally accepted that businesses should help subsidize the costs of infrastructure and municipal services—even if that subsidization artificially escalates demand and leads to problems of inefficiency. A second, and more important reason, is that local businesses have the capability—under the right circumstances—to export these taxes or shift them onto someone else. One study in Canada estimated that about 56% of all non-residential property taxes in the biggest cities are exported to other jurisdictions. Tax exporting tends to be particularly high on properties such as railroads and public utilities, as well as larger industrial properties. In other words, businesses can effectively recoup some of these taxes.

In scanning the various taxes employed by local governments, four basic business taxes emerged aside from the supplemental business property tax (typically based on the annual rental value or square footage of various commercial and industrial properties) and the standard franchise fee or sales tax on public and private utilities.

Gross Receipts Tax: This tax functions much like a utility franchise tax, but it is applied to all types of businesses. With a gross receipts tax, cities set a tax rate expressed in percentage terms and apply it to the gross earnings of various businesses. At first glance, a gross receipts tax appears to be a modified form of a corporate income or sales tax. However, the tax does not apply to net sales or profit, and it is not collected at the point of sale. Rather, amounts payable are often remitted by businesses, either quarterly or annually, using a tax form. The City of Seattle uses a gross receipts tax, set at 0.215% for retail businesses and 0.415% for all other businesses.

Payroll Tax: Under a payroll tax, businesses remit to local governments an amount based on a certain percentage of

the company's payroll. Across the US, 16 states allow local governments to levy a tax on employer payrolls. Local payroll taxes are used to support the operating and capital needs of public transportation in both the US and Europe. Portland and Eugene, Oregon are perhaps the most well-known US examples, but cities in the states of Indiana, Kentucky, Ohio, and Washington also use them to fund transportation infrastructure. Dedicated local employment taxes have also been used in France. The tax is paid by firms with more than 9 employees, unless they are housed on the business premises or the firm provides transportation for its employees. In Vienna, the underground subway was also funded by a local payroll tax.

One of the advantages of a payroll tax is how it can be custom tailored to provide certain financial incentives. In the US, some state and local governments have exempted small businesses, but many have also decided to waive the tax when a business provides its own transportation for employees, issues free passes for public transit, or it has a car pool or van pool program.

Employee Tax: Employee taxes require businesses to pay an amount based on the number of workers that they employ. The tax is usually a flat dollar amount per each employee. Employers and employees often split the cost of the tax, which is usually deducted at source and remitted on a monthly basis. The City of Denver imposes such a tax—the Occupational Privilege Tax. All employees earning in excess of \$500 per month and working in the city are required to pay \$5.75 per month. Employers pay \$4.00 per employee per month. The total tax thus equals \$117 per year for each employee. The City of Seattle could levy a \$2.00 tax per employee per month for roadways, and a similar \$2.00 tax for transit. However, the City has not implemented these taxes.

Business Occupation Taxes: The business occupation tax is a catch-all phrase for a whole hodgepodge of various taxes, licensing fees, and other levies based on the business type, activity, or some other non-conventional tax base. The versions of the tax are virtually endless. An interesting example comes from the City of Lincoln, Nebraska. This City's Business Occupation Tax targets vending machine owners with a flat dollar amount per each machine they operate. The amount of tax depends on the price of the goods being dispensed.

Each business tax has its own advantages and disadvantages. A gross receipts tax links to consumption, and as such, the value of the revenue stream grows as consumption and business sales increase. The advantage of the employee head tax is that people working in a city but residing elsewhere contribute at least a modest amount to the city. The advantages of other business and occupation taxes can only be assessed on a case-by-case basis. At the same time, there are a number of disadvantages with these taxes. From the perspective of business, none of them resemble a tax on profit, and thus suffer from the same criticisms typically levelled against the property-based square footage business tax. A company may very well have millions in annual gross earnings, yet fail to make a profit, and still face a substantial tax liability. Employee head taxes suffer from the same criticisms levelled against all types of payroll taxes, with the most devastating charge being the negative impact on job creation.

Other Taxes

Property taxes and other real estate taxes, income taxes, general retail sales taxes, selective sales taxes, vehicle-specific sales taxes and various business taxes comprise the fodder out of which most local government tax systems are created. This holds whether one looks at North America, Europe, Southeast Asia, or Australasia. Outside of these taxes, there are only a few options remaining.

Head Tax: Head taxes are sometimes called poll taxes, capitation taxes, or soul taxes. A head tax is a uniformly applied and fixed amount paid by each individual in a city. Under a head tax, every person living in a city, regardless of income or whether they own property or not, pays the tax. Such taxes were common into the 19th century, but are virtually unheard of today. The UK tried to force local municipal councils into levying a poll tax in the 1980s—euphemistically called the Community Charge. The tax resulted in numerous tax riots across the country. The City of Seattle could theoretically implement a form of poll tax. Seattle is authorized to levy a flat tax of up to \$1.00 per each household for transportation, but currently does not levy the tax.

Miscellaneous Taxes: Local governments likely levy additional types of taxes aside from the ones presented above. However, given the size of the infrastructure challenge, they are both small and insignificant.

C. EXPANDED TAX REVENUE SHARING

When it comes to expanding the list of taxes for local governments, the best option would be for cities themselves to assume their own basket of taxes, set their own tax rates, and then piggy-back the taxes off various provincial and/or federal tax bases. This is the approach generally followed in both the US and Europe. This is the most efficient option, and it would also allow taxpayers to hold local governments accountable for the taxes they collect (Burleton 2002).

However, there are a number of reasons why this approach may not be workable. Some taxes, particularly income taxes and general retail sales taxes, can be quite difficult to levy at the local level—they produce significant economic distortions, and Canadian cities are not well experienced with these types of taxes. While the federal government may be sympathetic and support increased local taxing authority, it has no constitutional power to facilitate such a change. That right is wholly reserved to the provinces, which may not be predisposed toward this option. But the federal government could expand tax revenue sharing based upon the current fuel tax arrangement. Public opinion also swings in favour of expanded tax revenue sharing. In 2003, the Canada West Foundation conducted a public opinion survey of 3,200 western Canadians. Only 36% agreed that local governments should cut their property taxes and replace the lost revenue with a new basket of taxes. However, 77.8% were in favour of tax revenue sharing and 82.5% were in favour of earmarking that, particularly for transportation infrastructure. For all these reasons, expanded tax revenue sharing emerges as a second best alternative.

Advantages

The benefits of expanded tax revenue sharing are a direct function of what taxes are shared, how they are shared, and whether the agreement is subject to cancellation based on political or economic exigencies. Virtually any tax can be shared—income taxes, general retail sales taxes, selective sales taxes, vehicle-specific sales taxes, and other real estate-based taxes. However, a share of federal or provincial income taxes and general retail sales taxes are the strongest and most buoyant alternatives. These taxes are the most able to capture a portion of local economic growth, they produce steadily growing revenue, and their potential depends on the vitality of the tax base rather than increasing the tax rate.

Unlike selective sales taxes or vehicle-specific taxes, income and general retail sales taxes also entail the most difficulties when levied at the local level. As such, it is more appropriate to use tax revenue sharing with these two taxes.

In terms of structuring a tax revenue sharing agreement, there are two basic options. First, the tax-sharing can be based on point of sale. For example, a state or province might levy a 10% sales tax on lodging. The state or province then shares with a city 3% points (or 30% of the revenues) of the 10% tax. With this type of tax-sharing, the city receives revenue equal to 3% of all lodging consumed in the city. This form of tax-sharing is the most powerful, because it allows cities to capture a portion of the revenue generated within their own boundaries—the tax links directly to local economic activity and growth.

Second, tax-shared revenues are sometimes pooled and then remitted according to a formula that equalizes the amounts across various municipalities. While such formulas can be very complex, they typically include population size, the value of the local tax base, or some combination of the two. In some instances, both point-of-sale and equalized formulas are used to share taxes.

The latter approach is less of a tax revenue sharing arrangement and more of a grant. While this grant is tied to a specific tax—an improvement over the standard grant—it is still a grant nonetheless. One of the positive features about the fuel tax revenue sharing agreement between Alberta and the cities of Edmonton and Calgary is how each city receives 5¢ per each litre of fuel sold within its boundaries. That is tax revenue sharing.

The benefits to infrastructure of tax revenue sharing also depend on whether the agreement can be kept in effect over the long-term. Agreements that are short-term in nature (less than 10 years) or that can be easily modified or cancelled are of limited use as a funding mechanism. Such agreements would entail significant risk if the revenues were used to fund long-term borrowing. As such, the revenues would be limited to funding pay-as-you-go infrastructure only.

Disadvantages

Tax revenue sharing provides cities with indirect access to a wider range of tax revenue and avoids some of the thorny

problems with locally levied sales and income taxes. However, issues of accountability and transparency still remain. If the tax-shared-revenues are also subject to overly stringent conditions, the approach may also reduce autonomy in local decision-making. In the light of less workable options, this may be the trade-off that is required. At the same time, work can be done to limit these disadvantages. Tax revenue sharing need not be conditioned to specific projects, but simply to infrastructure in general. Receipt of funds can be conditioned on the proper accounting for assets created with tax-shared dollars. This, combined with regular audits and public reports issued on the usage of such funds, can ensure better accountability and transparency.

Winning Conditions and Applications

Expanded tax revenue sharing can go forward in the same three ways as expanding local taxing authority. The most often mentioned approach is a direct transfer of provincial tax revenues to municipalities. This reflects the typical arrangement in the US. Canada also has experience with this approach. British Columbia used to provide municipalities with a 1% share of provincial personal and corporate income taxes, as well as a 6% share of various other taxes (Union of British Columbia Municipalities 1993). The current Manitoba model shares 2.2% of the provincial personal income tax and 1% of the corporate income tax (City of Winnipeg 2000). At the same time, expansion is likely not on the table. Most provincial budgets are strapped with spiraling health and education expenditures—there is little room to transfer provincial tax points.

A second possibility is to have cities commit to a one-time but dramatic cut in their property tax take, followed with negotiations for an increase in various provincial income or sales taxes that can then be transferred for municipal infrastructure. As already noted, this option is quite attractive. However, it has yet to build up real traction on the ground.

Thus, the only way forward may be for Ottawa to step into the vacuum. The federal government has registered significant budget surpluses over the last few years, and its net debt-to-GDP ratio has fallen from a high of 73.5% in 1995/96 to only 33.3% today. The federal government could cede tax points to the provinces on the condition that the revenues flow to local governments and are used for municipal infrastructure. Based on the 2006 federal budget, a small 0.5% share in

the personal income tax, the corporate income tax, and the GST would result in a \$900 million shot in the arm for urban infrastructure on a pay-as-you-go basis.

If that tax revenue sharing were guaranteed over the long-term, it could support the borrowing of \$13 billion in up-front financing, putting a real dent in the municipal infrastructure challenge. (Borrowing here is based on a 25 year amortization with an effective interest rate of 50 basis points over prime, or 200 basis points over the average 2005 bank rate). Because these taxes are more buoyant, the total amount of infrastructure investment would also grow over time. While the amounts seem huge, \$900 million a year for the federal government is only 25% of its anticipated surplus for 2006/07. One of the advantages of this approach is how the federal, provincial, and municipal governments would be working together in resolving an issue of considerable national importance.

Whatever form expanded tax-sharing takes, it must go beyond the modest approaches relied on in the past and the various fuel tax schemes now at work—look at Canada’s competitor cities. Cities in Arizona receive a 25% share of the state sales tax. Phoenix alone receives 33% of the total amount provided to municipalities because of the size of its population. This, combined with a separate local sales tax, generates 45% of revenue for the City of Phoenix. The City of Denver has access to its own sales taxes, in addition to a share of various state taxes including the general retail sales tax, fuel tax, tobacco tax, vehicle registration tax, and lottery revenues. Seattle receives revenue from 10 state taxes, including the state general sales tax, severance taxes (or natural resource revenues) and state taxes on liquor, fuel, lodging, and insurance premiums.

D. MODIFIED CONDITIONS FOR FEDERAL AND PROVINCIAL CAPITAL GRANTS

Federal and provincial conditional grants for urban infrastructure are problematic for a number reasons: 1) they can skew local priorities; 2) they do not always address the most pressing needs; 3) they are often unpredictable; 4) they weaken accountability because local revenue is not used for local infrastructure; and 5) they have high transaction costs that produce fiscal leakage.

In the light of this, a number of cities are advancing the idea of putting an end to grants and arguing that the best way forward is to secure expanded powers of local taxation. Cities

could then raise their own revenue and answer to their own taxpayers for doing so (or not doing so). Expanded local taxation powers would also bring into play a wider variety of innovative funding tools. This is, however, a contentious issue and is not likely to be resolved in the short-term.

In the meantime, there are ways to improve the current granting system so that it encourages innovation.

Over the last decade, state and local governments in the US have been able to take advantage of several innovations in the usage of federal-aid grants for transportation and public transit. Many of these innovations were first developed as pilot programs, and trace their development back to the TEA-045 initiative of the Federal Highway Administration (FHWA), a branch of the US Department of Transportation (USDOT). TEA-045 began in April 1994 with the stated purpose of introducing flexibility into federal-aid transportation grants. The purpose of the innovations were to increase state and local infrastructure investment, accelerate projects, improve the usage of new financing opportunities, and lay the groundwork for a set of major long-term changes to federal-aid grants. The innovations later became part of the National Highway System (NHS) Designation Act of 1995, the Transportation Equity Act for the 21st Century (TEA-21), and its successor, SAFETEA.

The innovations incorporate three specific reforms. First, state and local governments were allowed to use a portion of their federal-aid grants to repay long-term bonds issued for transportation infrastructure. Second, new flexibility was built into the requirements for state and local cost-sharing. Third, new federal-aid grants were made available that were not conditional on carrying out a specific project, but on whether or not a project incorporates innovation in design, technology, financing, funding or delivery.

At the root of these reforms is the realization that conditions on a grant, in and of themselves, are not always the problem. Much depends on what the conditions require. Traditionally, conditional grants have been project specific. The US innovations turn away from this approach in favour of stimulating borrowing and use of innovative financing, funding and delivery tools. Examples include new federal-aid grants contingent upon the implementation of innovative pricing strategies such as road tolling initiatives and the use of public-private partnerships (PPPs).

Advantages

In Canada, a lot of local infrastructure investment is heavily tilted toward the pay-as-you-go approach. Most federal and provincial grants form part of this pay-as-you-go envelope. However, if grants are allowed to be used for the repayment of debt, then local governments may start to overcome some of their hesitation to borrow. This will yield more up-front funds for infrastructure. By building more flexibility into cost-sharing requirements, the pressure on local capital budgets is reduced, and cities will start looking for new ways to meet their funding share—perhaps by seeking out private sector involvement. Grants that are conditional on innovative financing, funding and delivery ensure that these new tools move off the research table and start running on the ground. According to the FHWA, as of September 1999, the innovations developed under TEA-045 have supported 98 projects across 24 states with a total combined value of some \$7 billion.

Disadvantages

A key disadvantage is that the innovation is imposed by the conditions of the grant rather a product of local initiative and experience. This points to the need to keep the conditions relatively flexible such that local governments can select the innovative tools most appropriate to their unique circumstances. In addition, grants in any form perpetuate the gap between services delivered (in this case urban infrastructure) and the government raising the revenue to pay for those services.

Winning Conditions and Applications

Obviously, federal and provincial approval will be necessary to kickstart innovation with capital grants. This will require more than a series of legislative amendments—it involves a wholesale culture shift within federal, provincial, and local governments. This will take time. Assuming that it can work itself out, the single biggest factor is a commitment to maintaining a stable and predictable flow of grants over the long-term, up to 25 years or more. Unless this commitment is firmly in place, local governments will not run the risk of borrowing against future grants. Given the past experience with grants, local governments simply cannot finance long-term debt when the future funds needed to pay interest and principal are questionable. In order for cities to begin more actively partnering with the private sector, they also need

to develop expertise and invest in a range of financial and legal skills that make such relationships effective. Policies and procedures need to be developed, projects identified, and a flow of infrastructure deals created. If a long-term commitment is not in place, local governments will simply view innovation with capital grants as a blip on the radar screen and wait for things to get back to normal. A consensus between the various governments—federal, provincial, and municipal—needs to be forged in order to stimulate what is arguably a major paradigm shift.

Borrowing and Grants

In the US, innovations in federal-aid grants for transportation have encouraged state and local governments to increase their use of debt-financing for infrastructure. Three vehicles have been used for this purpose, including Grant Anticipation Revenue Vehicles (GARVEEs), Federal Revenue Anticipation Notes (FRANs) and a process called Conversion of Advance Construction.

GARVEEs are a new type of grant anticipation note (GAN), which secures bonds based on the future receipt of federal grants. GANs have been used in the US by schools and hospitals for some time. GARVEEs extend the GAN approach to state and local infrastructure. When issuing a GARVEE-backed bond, future federal-aid grants are pledged as the repayment mechanism for both principal and interest. Prior to the new NHS Act of 1995, federal-aid grants could only be used to repay the principal portion of a bond. With a GARVEE, grant recipients can use federal-aid funds to pay both principal and interest, as well as other costs associated with bond issuance. TEA-21 increased the predictability of future federal aid for transportation infrastructure, and have made GARVEEs an attractive alternative.

The use of GARVEE has enabled US states to assemble significant up-front capital for state and local infrastructure without negatively impacting their bond ratings or exceeding their own legislated debt ceilings. By pledging only a relatively small portion of their anticipated future grants, state and local governments have been able to leverage large amounts of financing. This has helped to speed up the construction of various transportation infrastructure projects and avoid the risk of higher costs due to future inflation. GARVEE-backed bonds can be issued by a state government, a political subdivision of the state, or a designated agent.

There are two downsides to the GARVEE. First, GARVEE confronts grant recipients with a trade-off. A decision needs to be made whether to build infrastructure today with tomorrow's grants. GARVEEs lock up a portion of future grants that are not available for other purposes. However, this is a standard trade-off required for all types of debt-financing. Second, GARVEEs are not entirely risk free. TEA-21 did ensure better predictability of future federal-aid funding, but only across the 5 year period during which the grants were authorized (1998-2003). While future congressional authorizations will not see federal-aid funding disappear, there is no absolute guarantee that the funding will be increased. Thus, GARVEEs that stretch out over several granting authorization periods are subject to some risk. This has forced some states to issue only relatively short-term GARVEEs. At the same time, the US bond markets have tended to treat GARVEE debt quite well. In some instances, GARVEE-backed debt has received higher bond ratings than the traditional GO bonds due to the indirect federal involvement.

GARVEE can only be used for specific transportation projects eligible for federal-aid funds. Also, the infrastructure funded through GARVEE must be incapable of generating its own stream of revenue. GARVEEs are to be used only for non-marketable infrastructure. Typical projects must also be large scale and have a high priority. Eligible infrastructure must be on the State Transportation Improvement Plan (STIP) and be approved by the FHWA. A key consideration of whether to use GARVEE or not is whether the costs of a delay clearly outweigh the costs of financing. Typically, GARVEEs are seen as a last resort—when other forms of borrowing are not feasible or a state is unable to support a bond issue with its own full faith and credit. Typical applications of GARVEE include highways, congestion mitigation projects, transit, and bridge replacement.

GARVEEs also come in many different variants. Some GARVEEs are insured, while others are not insured. Non-Recourse GARVEEs are secured only by future federal-aid grants, while Back-stopped GARVEEs also include state revenue as a back-stop in case the grants do not materialize. Short-term GARVEEs pledge only the grants anticipated in the current authorization period, while Long-term GARVEEs stretch over two or more authorization periods.

In 1998, New Mexico became the first state to use GARVEE. The state raised \$100 million to upgrade 118 miles of Corridor 44, a primary trade and tourist route. The bonds were a non-recourse GARVEE, backed only by future federal-aid grants. The success of this project led Ohio and Massachusetts to follow suit. Arizona, Colorado, Mississippi, and New Jersey followed soon after (Schmidt 2000). In 1998 alone, almost \$800 million in GARVEE-backed debt had been issued. In 1999, Arkansas voters approved \$575 million in GARVEEs to finance state and local highways. By 2002, GARVEEs had been issued in 6 states.

There are two variations on the basic GARVEE approach. Federal Revenue Anticipation Notes (FRANs) are a special indirect GARVEE that provides more flexibility. With a FRAN, a bond can be issued that is backed by future federal-aid grants, but the proceeds of the bond can be applied with more discretion. FRAN-funded projects do not need FHWA approval.

Under Advance Construction and Conversion (ACC), a grant recipient issues a bond and begins construction before any federal-aid grants have been received. When the project is either partially or fully completed, it is converted to a GARVEE. ACC is helpful as a cash flow tool—where a project is so large it would consume too much of the grants available in any one year. Under ACC, grant recipients finance the project with non-federal funds, and slowly replace that funding with GARVEE-backed funding. The process has been in place with federal grants since 1956, but the recent changes have eased restrictions on the process.

Modified Cost-Sharing Arrangements

Recent changes in US federal grants incorporate three specific tools to ease the cost-sharing burden of state and local governments. The most popular of these innovations has been the flexible match. Before 1995, only cash from state and local governments could satisfy the matching requirements for a project funded with federal grants. All donations of state or local government materials and services, and any private sector financial contribution, came off the top of a project's total cost. Thus, the standard 80%-20% cost-sharing arrangement was left unaffected. With the recent changes, all of these contributions can now be counted toward the cost-sharing requirement. Because a private contribution of land, materials, and services can entirely

satisfy the conditions for cost-sharing, the result has been an accelerated completion schedule for infrastructure projects and a boost for PPP—governments have been provided with an incentive to seek out private participation. Under certain conditions, other sources of federal funding can serve to meet a cost-sharing requirement as well.

With the tapered match provision, grant recipients are allowed to vary the non-federal share of a federal-aid project over time, as long as the federal contribution does not exceed the federal aid limit of 80% when the infrastructure project is completed. Prior to the change, grant recipients were required to match federal grants on a payment-by-payment basis. Under tapered matching, federal grants can provide 100% of the funding in the early phases of construction, and taper off as construction is completed. This is particularly helpful for large projects with a long construction period, and where state and local governments currently lack the funds to cost-share. It is particularly helpful for projects that extend over several budget periods.

Specialized Grant Funding Requiring Innovation

One of the more exciting developments in the US granting system has been how federal-aid funds are now being used to lever innovations in financing, funding, and the delivery of infrastructure. For example, federal grants are now available that are conditioned on state and local governments using them to move a marginally marketable infrastructure into the marketable category. Specialized grants are also made available for projects that include significant private sector participation in the financing, design, and delivery of infrastructure through public-private partnerships. Other grants have been made available for various state and local experiments with various infrastructure pricing mechanisms. Special granting provisions have also been made available for new road tolling initiatives. The purpose of these grants is to encourage innovation in the financing, funding, and delivery of state and local infrastructure.

For example, in 1987, the FHWA started a pilot project that gave 9 states the authority to develop toll roads using federal grants. Under the project, up to 35% of the costs of a new toll road could be covered with federal-aid. Prior to this program, tolling was not allowed on a non-interstate highway that was constructed with a federal grant. The project was quite successful, and the grant program was expanded. Today, a

string of federal grants are available for the construction of new toll roads or upgrading and converting existing roads to user pay. Federal grants can be merged with toll revenues to cover the debt servicing of bonds taken on for the project, to cover operations and maintenance, and to support a reasonable return if the project involves private sector participation. Currently, there are 5 categories of tolling activities eligible for federal grants.

Second, the FHWA has struck a number of programs to fund various pilot projects experimenting with the concept of variable road tolling. Variable tolling employs recent advances in digital intelligent transportation systems (ITS) and electronic toll collection (ETC) to increase or decrease road tolls based on the level of congestion. Public agencies willing to experiment can apply for federal grants under the Value Pricing Pilot Program, which is designed to demonstrate and evaluate pricing concepts that achieve significant and lasting reduction in congestion. FHWA also conducts regional workshops around the country every year to educate state and local officials about the potential of such pricing mechanisms. Through FHWA's new Special Experimental Project (SEP-15) program, the special Pricing Pilot Program, and the new SAFETEA, the US federal government is running test projects on tolling, congestion pricing, and other innovative methods to get a better return on transportation infrastructure (Capka 2005).

A third change involves the creation of an innovative road toll credit program. Under TEA-21, state and local governments that funded capital expenditures through the application of road tolls were allowed to claim a portion of those tolls as a credit toward future federal matching grants. By using toll credits, the federal portion of future transportation projects could rise up to 100% if enough credits were eventually saved. The credits that a state can earn is determined by the amount of toll revenue used by tolling authorities to build or improve various roadway facilities. States can then apply these amounts as a toll credit toward the state and local share of a federal transportation cost-shared grant. Special accounts are used to track the toll credits as they are earned and used. As of September 2001, the state of Pennsylvania's toll credits totalled some \$1.2 billion. In 1999, Florida began using toll credits on almost every new roadway project in the state—most of its highway program is now 100% federally funded. Since the program began, the Florida Department

of Transportation had amassed some \$1.8 billion in approved toll credits for federal-aid highway projects (Federal Highway Administration 2004).

A significant improvement in the area of capital grants involves changing our notions about the purpose of conditionality. The various granting innovations in the US show how grants can leverage various innovative approaches. But reforming the capital granting process could be expanded even further. As noted earlier, one of the problems with grants is that they are free money. This has led to local governments putting down infrastructure in the past that was not properly accounted for, and for which no replacement funds exist today. Not only can grants be designed to leverage innovative financing and funding options, but they can also be conditioned on whether the grant recipients are properly pricing the infrastructure being granted, whether they are charging appropriate prices for the infrastructure, whether they are engaged in capital asset management, and whether they are including the costs of asset replacement in the prices being charged (Kitchen 2003). Failing this, grants may simply continue to perpetuate some of the very infrastructure problems which Canadian cities are now struggling.

SUMMARY OF TAXATION

Tax-based funding of infrastructure should be the choice of last resort—reserved only for infrastructure that cannot be funded through a user pay approach. Canadian cities are heavily reliant on two main sources of tax-based funding: property taxes and grants. Property taxes are not a buoyant source of revenue, and grants—as traditionally employed—have actually helped to create some of the infrastructure challenges now facing cities. There are four broad innovations that can help strengthen tax-based infrastructure funding. First, cities can employ tax incremental financing, which earmarks future property tax revenue growth to fund the rehabilitation of existing infrastructure. Second, cities could be given expanded taxation authority. Third, cities could be provided with enhanced tax sharing revenue. Options include different types of property taxes and other real estate taxes, general and selective sales taxes, vehicle-specific sales taxes, income taxes, and a range of special business taxes. Depending on the method of implementation, this additional taxing authority does not have to result in an overall increase in taxation. The types of taxes in play are just as important

as the level of tax revenue received. Finally, the conditions on capital grants could be modified to encourage borrowing for infrastructure, allow for more flexible cost-sharing, and leverage innovative approaches to financing, funding and delivering infrastructure. Movement on this front is critical to the proper financing of infrastructure. Only when tax revenue grows sufficiently over time can cities leverage that revenue with the debt-financing of infrastructure.

2.2. User Fees

Opposition to user fees arises because they are alleged to be regressive—that is, they absorb a higher percentage of lower income individuals' or households' income when compared with higher income individuals or households. But so is the price of milk and movie tickets.

—Harry Kitchen (Kitchen 2003)

Bankable projects are few and far between in infrastructure because of bad politics that treats payment of user charges as a crime against humanity that must be prevented at all costs.

—Editorial, India Times, November 4, 2005.

Local governments charge three types of fees. The first type is the regulatory fee, which recovers the cost of implementing various regulations and enforcing local by-laws. Regulatory fees include permits for construction and renovation, subdivision approvals, and changes in zoning. Regulatory fees also include licenses for operating a local business or owning a pet. As a source of infrastructure funding, regulatory fees are largely irrelevant.

The second type of fee is the trading fee. Trading fees are employed to fund the operating and maintenance costs of services and infrastructure that are marketable—where the good or service generates significant private benefits and where consumers can be identified and subsequently charged. Trading fees used on a partial cost recovery basis cover only a portion of the operating and capital costs of a service, with the remainder coming from taxation. Trading fees used on a full cost recovery basis cover all operating and capital costs. Some full cost recovery fees—especially those for water and sewer utilities—generate a profit that can be used to subsidize other municipal expenditures.

A third user fee is the development cost charge (DCC). This one-time fee is charged at the building permit stage,

and is levied against those developing new residential and commercial properties. DCC revenues are earmarked to recover the costs of providing new infrastructure. The fee is usually a standard charge based on the number of acres or hectares to be developed. DCC fees are sometimes waived if a developer builds the infrastructure and later donates it to the city. DCC fees are typically passed on to the purchasers of new homes and commercial property.

Advantages

To the extent that user fees are employed as a rational pricing mechanism, scarce resources are allocated efficiently. User pay systems that correctly price goods and services will result in the greatest amount of goods and services being provided for the greatest possible number of people, at the lowest possible price and the lowest total cost. Thus, user pay maximizes the overall benefit to society (Kitchen 2003). User pay is also efficient in that it limits waste and promotes conservation. When user fees are in play, individuals will consume only an amount for which they are willing to pay.

User fees promote efficiency by providing valuable information to producers and consumer of infrastructure. For example, continued strong consumption of user pay infrastructure gives governments confidence to further invest and enhance infrastructure (Congressional Budget Office 1988). User fees provide information to individual consumers about the costs of infrastructure, which ensures that they value what is supplied and they minimize waste. In short, user pay balances supply with demand.

When it comes to infrastructure and municipal services, user fees serve two functions. First, they play a vital funding role. This is important with respect to the supply of infrastructure. Second, they also play a vital role on the demand side. User fees limit the demand for infrastructure by charging individuals the true costs of using infrastructure. All of this is very different than tax-based funding. User pay quickly dispels the myth that public goods are free goods. It ensures that an increase in demand for services and infrastructure will be covered by those who want those services. User fees create a fiscal dynamic where people cut back on consumption to save money and use only what they need—as opposed to what they might want. User pay forces people to internalize the costs of their behaviour and modify that behaviour to avoid wasting their own money.

This is no small consideration. The municipal infrastructure challenge is not just a question about supply—how to get the necessary financing and funding to increase the amount of infrastructure investment. It is also very much a question about the demand for infrastructure. Funding infrastructure through taxation when user fees could be employed artificially increases the demand for infrastructure beyond what people are actually willing to pay. User fees keep the demand for infrastructure in check, while taxation cause demand to continually rise.

Taxation is the equivalent of the all-you-can-eat buffet. For the same low price everybody eats as much as they want. The all-you-can-eat buffet goes through a lot of food. User fees are the equivalent of the pay-by-the-ounce salad bar. Here, everybody eats according to what they are willing to pay. Less food is consumed. Similarly, taxation is like sharing the total restaurant bill equally. This encourages some individuals to eat more because those who eat less will be paying for a portion of their bigger meal. A user fee approach would see everybody paying their own part of the bill according to what they had ordered. The total bill is lower because everybody eats according to what they are willing to pay. The examples are not just economic theory. In Canada, studies show that the average household use of water by those who pay a flat amount can be up to 70% higher compared to households that pay according to usage (Deloitte and Touch 2004).

The effects of efficiency in infrastructure delivery are evident when comparing systems funded entirely by user fees with those funded by taxation or a system of partial cost recovery. When user pay systems are employed as a rational pricing mechanism, the appropriate capital investment signals are given (Slack 1996). Studies of water infrastructure, for example, show that, when user fees are the source of funding for system maintenance, and where sufficiently higher water rates were charged, those systems are meeting today's high standards and the system is in better shape than those systems where the rates were low and subsidized through taxation (Gore and Storrie 1999).

Infrastructure funded by user fees is less problematic than infrastructure funded through the tax base because user fees are attached and earmarked for specific services and they tend to be better funded over their life cycle. This is one reason why municipal utilities are typically in better

condition than other forms of infrastructure, and why the infrastructure challenge essentially lands on those systems currently supported by the property tax base (Vander Ploeg 2003).

Finally, municipal infrastructure funded through user fees offers good value. For example, user fees for municipal water and sewer services typically amount to only a few hundred dollars per year. Compared to the costs of other residential utility services—cable TV, telephone, electricity, and natural gas—water and sewer charges are quite modest. In short, user pay systems can fund essential health, public safety, and environmental protection infrastructure and services at a very reasonable cost (Gore and Storrie 1999). In the end, long-term debt-financing funded through user fees and beneficiary charges, provides the most efficient means for procuring and financing infrastructure (Dowall 2000).

Disadvantages

If a gain in efficiency is the single largest advantage of user fees, then a loss of distributional equity is the primary disadvantage. User pay pricing is often criticized because it is a less equitable way to fund public infrastructure and services. In other words, user fees are regressive. But this is not the whole story. When it comes to public infrastructure and services, equity is a multi-dimensional concept that includes notions of vertical and horizontal equity, as well as intergenerational equity. For example, taxation is vertically equitable—universal access is guaranteed regardless of income. But taxation is not at all horizontally equitable—individuals do not pay for what they consume. With tax-based funding, those who do not use still pay, and those who use only lightly subsidize those who use heavily. This is not the case with user fees, which are very horizontally equitable, but not always vertically equitable.

The debate over user fees is wrapped up in what can be termed the big economic trade-off. According to this trade-off, one can either maximize efficiency and horizontal equity, or one can maximize vertical equity and suffer less efficiency. However, one can never maximize both (Luciani 1996, Oakerson 1999, Parkin and Bade 1997). The matter here cannot be summed up in some rhetorical notion that tax-based funding is more equitable than user fees. The issue is a complex matter about which there is no universal agreement. Some even question whether tax-based funding at the local level can provide substantial vertical equity. If the local tax

A Canadian GARVEE?

Debt financing can generate a lot more up-front funding than a pay-as-you-go approach. In 1999, the California Budget Project Group in Sacramento released an infrastructure discussion paper showing that, under the prevailing financial market conditions, \$132 million in annual pay-as-you-go infrastructure financing could lever \$2.0 billion in one-time funding through the issuing of a 25-year general obligation tax-exempt bond.

Canadian cities do not have access to tax-exempt bonds, but borrowing still produces some impressive numbers. For example, the City of Calgary received some \$185 million in federal and provincial grants and tax revenue-sharing in 2005. In the next few years, Calgary will be receiving another \$80 million annually in federal fuel tax revenue sharing, for a total of \$265 million annually. Assume that the City used these grants to debt finance infrastructure. If the borrowing was conducted at 200 basis points over the 2005 bank rate (or 50 basis points over prime), Calgary could issue over \$3.8 billion in debt, entirely funded with the \$265 million in grants. If the amortization period were stretched from 25 years to 30 years, even more financing would be made available.

To be sure, the costs of interest would not be insignificant, amounting to \$2.795 billion over 25 years. But if inflation runs at 2.0% annually for the next 25 years, the original \$3.8 billion worth of infrastructure will cost \$6.160 billion, or \$2.330 billion more than if it were constructed today. The net cost of borrowing amounts to \$465 million over 25 years, about \$18.6 million per year. While it certainly would not be wise for Calgary to use all of its grants for debt financing, even dedicating a small portion can yield significant infrastructure financing.

As most homeowners can attest, borrowing becomes less of a burden as time passes. Assume a person bought an average-priced home in 1990, carrying a \$100,000 mortgage. Monthly payments would run about \$650 per month or \$7,800 a year. If this homeowner were earning \$35,000 annually, the payments would represent 22.3% of the income earned. But incomes are not static. If the homebuyer earns a modest 2% increase in salary every year, by the time the mortgage is repaid in 2015 the \$7,800 in annual payments are only 12.5% of income. The same dynamic is in play for government debt as well.

regime bears heavily on the less wealthy, then tax-based funding can be just as regressive as user fees. According to one study on the funding of physical infrastructure, this may indeed be the case for local tax systems, especially those heavily dependent on the antiquated property tax (Advisory Commission on Intergovernmental Regulations 1984). But even here, user fees have the advantage in that they can be avoided by simply not using a service. Taxation cannot be avoided.

Others suggest that vertical equity issues with municipal infrastructure and services have been overstated, if not entirely misunderstood. For example, assume that a city decides to subsidize its water service to lower the costs for those with low incomes. Because of the tax subsidy, more water is used and more infrastructure is demanded. This raises the total cost of providing water to everybody. But who is subsidizing whom? That depends on who consumes the most water. Is it low income folks who live in an apartment with a small patch of grass beside the walkway? Or is it the wealthy couple with the huge lawn out front, the pool out back, the jetted tub inside, the large SUV to wash in the drive, and who hit the links twice a week on the local irrigated golf course? In such a circumstance, it is higher income households being favoured (Slack 1996).

A ground-breaking study of several US metropolitan areas arrived at this very conclusion when it came to public transit. The study concluded that, as presently financed and operated, many urban public transit systems actually result in the less wealthy subsidizing the transit use of the more wealthy. This occurred because the poor tend to live in the inner-city and take much shorter rides than the wealthy, who tend to travel much further distances to the outlying areas of the city (Advisory Commission on Intergovernmental Relations 1984).

The cross-subsidization of municipal infrastructure and services is a complex issue, and is virtually impossible to sort out. However, some suggest that if the real nature of this redistribution could be known, most would find it completely unacceptable (Kitchen 1993). Yet, a major argument for subsidizing infrastructure and services through taxation is the redistribution of income to the less fortunate. Tax-based infrastructure funding does this by transferring income in the form of a good rather than cash. However, given the loss of efficiency and the possibility of reverse redistribution,

surely any intended redistribution could be accomplished in a better way without driving up the costs of infrastructure for everybody or perpetuating inefficient capital budgeting and spending. A direct transfer of income is more effective and efficient (Kitchen 2003; Deloitte and Touche 2004).

A lack of vertical equity is not innocuous—it results in low and medium-income individuals having to pay a larger portion of their income to access certain infrastructure or municipal services, or even leaving a portion of the population with little or no access to beneficial infrastructure and services. But user fees can be designed with fairness to lower income persons in mind. Such strategies can include rebates or special rates. The US, for example, has a long-standing tradition of offering lower income households with discounted lifeline rates for various private and public utilities such as telephones, electricity, gas, water and sewer (Dowall 2000). Other ability-to-pay offsets such as regulated tariffs, means-testing for vehicle registrations, and various voucher systems can also be employed. The costs of these strategies have been significantly reduced given advances in digital technology that can be combined with personal income tax information to produce smart cards that allow access to lower user fees. Partial cost recovery only can also be used. Unfortunately very few pilot programs have been designed to test these strategies. In the future, governments should be working with these ideas. If they are effective and feasible, they would give much more impetus to designing more accurate pricing schemes (Dowall 2000).

Vertical equity is certainly the biggest issue, but it is not the only disadvantage with user fee funding. To the extent that cities are employing correct pricing for their services, user fees have limited potential for growth. While user fee revenue will increase as more people use more services, any net revenue gain is offset, in whole or in part, by the increased costs of providing more services. For user fees to contribute meaningfully to an increase in total infrastructure funding, cities would have to substantially increase fees relative to the costs of providing services. Unless those services are currently underpriced, this would violate the principle of proper pricing. Consumption would fall below optimal levels and society would be worse off rather than better off.

User fees are also difficult to use when it comes to funding pay-as-you-go infrastructure. User fees trickle in to government

coffers to cover current operating costs. The only way user fees can be used as a pay-as-you-go funding mechanism is if they are first saved in a reserve fund. Using reserves to fund certain infrastructure can reduce intergenerational equity. As such, user fees are most often used to fund the debt-financing of infrastructure.

Winning Conditions and Applications

Rational pricing and low-cost and practical ability-to-pay offsets are necessary requirements for a well functioning system of user fees. But these are not the only winning conditions. On what infrastructure should user fees be employed? The short answer is wherever and whenever possible (Kitchen 2003). When it comes to infrastructure funding, the first option is always to consider a direct user fee. If that is not possible, then the second best option is an indirect user fee or a user tax (e.g., fuel tax or local improvement levy). General tax funding should always be reserved as the option of last resort.

Because user fees directly recoup costs from infrastructure as it is being consumed, user fees reserve other funding sources for infrastructure that can be financed in no other way. This is no small matter. Whenever needs exceed the available financial resources—and they always do—choices have to be made. Those choices are difficult. Does the bridge get fixed or does the recreation centre get built? Does the new road go ahead or the new recycling facility? If the bridge and the new road can be tolled, and the recycling facility can be built on a completely user pay basis, that leaves the tax funding for the recreation centre that likely cannot survive on its own cash flow. All four projects can go ahead. By having a user fee first policy, the list of tough choices can be reduced to the infrastructure that can only be funded through taxation. User fees reserve tax capacity at the same time that they encourage debt-financing since they are not well-suited for pay-as-you-go.

The problem of course, is that not all services can be funded through user fees, regardless of how much one tries. The key characteristic here is marketability—whether the infrastructure in view possesses the right mix of attributes that will allow it to be funded solely through user fees. User fees are appropriate for infrastructure that generates significant private benefits, where consumption can be measured, non-payers excluded, all operating and capital costs measured, individual users

identified and charged, and where some usage varies between individuals. User fees are not appropriate for infrastructure that produces large positive externalities. While caution should be exercised when applying user fees to infrastructure that resembles a merit good—full cost recovery could result in a less than optimal level of usage—this is a very subjective question. User fees with ability-to-pay offsets should still be given full consideration.

Large projects with high up-front costs, complex technology, and long construction periods will make the application of a user fee funding approach risky. For these projects, considerable work needs to take place to measure market demand and to identify and implement various strategies that reduce the revenue risk. All of this is intensified when the infrastructure possesses a long asset life and will entail high future revenue commitments in terms of both operating and future maintenance. If the planned user fee approach does not work, then there is the prospect of a long-term and continual draw on future tax dollars. Marrying a user fee approach with a public-private partnership is proving helpful in moving these types of projects along while lowering the risk.

The priority status of an infrastructure, its visibility, and whether it is highly regulated or not, are largely irrelevant considerations. However, the matter of new infrastructure is not. To the extent that new infrastructure is driven by new residential and commercial developments, development cost charges (DCCs) should be used.

While stand-alone infrastructure is the best target for full cost recovery through user fees, integrated systems should not be ignored. When confronted with a highly integrated infrastructure system, it should be closely examined to see if components can be carved off and funded on through user fees. If this can be accomplished without compromising the overall functioning of the larger system, a user fee approach should be considered.

Intuitively, hard economic infrastructure is a better fit with the user fee model than soft social infrastructure. But this is open to debate. The more relevant consideration here concerns actual usage. If the usage will be broad in terms of lower and higher income individuals, then user fees can still be employed. However, if usage will be heavily concentrated

among low income individuals, then governments should proceed with caution. However, a low fee that produces no adverse effects can still be used to partially recover costs and help check excessive demand. If usage is generally confined to those with medium and high income, then user fees are an excellent fit. However, accurate pricing is still the goal. If the infrastructure and related services are charged at a higher rate than the operating and capital costs warrant, then lower usage will still result, along with a lower level of user fees.

Some argue that user fees are not appropriate for what can be termed essential-use public infrastructure. But this too is debatable. For example, safe water is certainly essential, but that infrastructure is one of the best candidates for user pay. Many cities also follow that approach. But what about the right to drive a privately owned car on a tax-funded roadway? That is not essential if an effective transit system is in place. Yet, most urban road networks are entirely tax-funded. In the end, the concept of essential-use is not that helpful. In fact, some of the most essential goods and services are always provided on a user pay basis—from shelter to groceries. The reason is that user pay provides the most goods at the lowest price for the greatest number of people. This trumps any notion about essential-use.

2.2.1. Traditional User Fees

A. TRADING FEES

When it comes to user fees and municipal infrastructure, local governments are usually less interested in employing user fees as a price signalling device that ensures efficiency and more interested in generating some non-tax revenue. This happens for a number of reasons.

Partial Cost Recovery

For many local governments, user fees are set only to cover a portion of the operating costs of municipal infrastructure and services. In 1985, the Federation of Canadian Municipalities (FCM) conducted a study of water. They concluded that water fees in Canada covered only 82% of the costs of supply, 85% of the costs of distribution, 50% of the costs of wastewater collection, and only 65% of the costs of wastewater treatment. The remaining costs are covered through taxation. In addition, for infrastructure and services where all operating costs are recouped, user fees typically exclude the costs of

infrastructure. A municipal service has two cost elements—operating and capital. For user fees to provide the full benefit of efficiency, prices must be set to cover both. However, this rarely happens. Because the costs of infrastructure depreciation are not being covered, there is a lack of funds for infrastructure rehabilitation (Slack 1996).

This problem is generally recognized across the municipal financial community. The City of Ottawa, in its long-term financial plan, admitted that there is no standard approach to determining the amount of direct and indirect operating and capital costs that cities should recover through fees. Currently, most fees only pay for some direct programming costs. Overall, they do not recover capital costs associated with service delivery (City of Ottawa 2005).

Average Cost Pricing

Even when user fees recoup all the operating and capital costs, the price charged typically reflects average costs but not marginal costs. Under average cost pricing, the total costs are calculated and divided by the total number of users. The price charged is then based on this average cost. Because governments have not put much effort into aligning the price of infrastructure and services with the marginal costs of delivery, the effective price for some users is higher than what it should be based on the costs of delivering infrastructure and services and vice versa. This leads to subsidization effects which undercut the efficiency potential of user fees.

Inappropriate Rate Structures

Partial cost recovery and average cost pricing are often married to user fee structures that do not accurately price municipal infrastructure and services. Water provision is the classic example. In Canada, there are five types of water rate structures: 1) flat or fixed rates; 2) constant unit rate; 3) two-part tariff; 4) decreasing block rates; and 5) increasing block rates. With a flat rate the fee charged is unrelated to the amount of water used. Water usage is not metered. While the flat rate may vary by type of customer (e.g., residential or commercial) or the number of water fixtures on a property, the rate is unrelated to usage. Such rates act more like a tax than a user fee.

Constant unit rates are related to consumption—the more water one uses, the more one will pay. However, the rate

itself does not vary based on the amount used or the actual cost of delivering the water to different properties. The rate is the same for each litre of water used, and everybody pays the same rate. Two-part tariff structures combine a flat rate for certain fixed costs (e.g., customer billing, capital costs) and a constant unit rate for variable costs (e.g., the amount of water used).

With a decreasing block rate, there is usually a fixed rate combined with a volume charge. The volume charge, however, decreases as the volume of water used increases. Of all the water rates available, this is the least preferred from an efficiency standpoint. Yet, it is one of the most common forms of variable or volumetric water charges (Slack 1996). Decreasing block rates are inefficient because the user actually pays less when more water is used. Not only does this encourage over-consumption, it results in a larger burden on light users. Such rates increase infrastructure maintenance and rehabilitation costs more quickly than the user revenue they generate.

An increasing block rate is the direct opposite of a decreasing block rate. Increasing block rates have a flat or fixed charge combined with a volumetric charge that increases in various steps as consumption rises. This is often seen as the most efficient and beneficial water charge, but it is also the least common.

The most common type of water user fee in Canada is a flat rate. A 1995 study of 1,200 Canadian municipalities found that half were using flat rate water pricing, and about 10 million water customers are not metered (Slack 1996). An early study in 1987 conducted by Environment Canada surveyed 470 municipalities. This study found that 37% used a flat rate charge, 34% used a decreasing block rate, 27% used a constant unit rate, and only 2% used an increasing block rate. The inevitable conclusion is that water is not priced accurately.

Advantages

From an efficiency standpoint, there are no advantages that come from such approaches to user fees. However, the approach is easy to implement, it raises revenue, and it does cover a portion of total operating costs. Other than that, the traditional approach to user fees does not come highly recommended by most municipal financial analysts.

Disadvantages

The result of user fees that do not correctly price services is over-consumption, artificially increased demand for infrastructure and services, and a lack of capital funding for infrastructure. This is certainly the case for most water infrastructure, and to the extent that similar pricing practices affect other municipal services and infrastructure, much the same can be said to apply. Under ineffective pricing schemes, property owners in the outlying areas where the costs of infrastructure and service delivery are higher pay less than the marginal cost of providing the services to them. They receive a subsidy. Those in central high-density areas pay more than the marginal cost of services. All of this is a recipe for sprawl, which is a key driver of the urban infrastructure challenge.

Winning Conditions and Applications

The under-pricing of some infrastructure and services is often defended because full cost recovery and marginal cost pricing cannot be applied. Some services involve infrastructure with very large fixed costs, but the variable costs are small. Transit is the classic example. Transit systems often operate at less than capacity and the marginal costs of an additional passenger are quite low. If the price is set to equal marginal cost and full cost recovery is employed, usage would fall and lower total revenue would result. Here, user fee revenue is maximized under an average cost scenario with partial recovery, but not a marginal cost scenario (Enoch, Nijkamp, Potter, Ubbels, and Verhoef 2000). Partial cost recovery and average pricing is also used for other types of municipal infrastructure as well, including recreational and tourism-related infrastructure (e.g., hockey arenas, pools, integrated leisure centres, zoos, auditoriums) and cultural facilities (e.g., museums, libraries, concert halls, theatres). It is also used for infrastructure with a social service element (e.g., seniors' lodges and affordable housing).

This approach, however, is not necessary for all types of municipal infrastructure. Some form of marginal cost pricing and full cost recovery can be employed with respect to large utility systems and other infrastructure such as parking garages. The problem is, some cities undercut their user fees in an attempt to lure industry and commerce, enabling them to increase the local tax base (Gore and Storrie 1999). But this approach can only succeed at the expense of a much less efficient municipal operation, and the under-funding of necessary infrastructure.

B. DEVELOPMENT COST CHARGES

Development cost charges (DCCs) are special user fees assessed to developers of land for both commercial and residential purposes. The idea behind the charge goes back to the notion of value capture—developers reap an economic benefit from their activities, and part of that benefit accrues from public infrastructure. Developer charges are typically negotiated for a specific term, and a one-time fee per acre or hectare developed is charged at the time that subdivision, rezoning, or the development plan is approved.

The terminology surrounding development cost charges is horrific. These fees are alternately termed exaction fees, impact fees, linkage fees, concurrency fees, system development charges, mitigation fees, negotiated contributions, capital value charges, hectareage assessments, cost impact mitigation payments, and development levies. In Alberta, DCCs are called lot levies. In Saskatchewan they are called development fees. In British Columbia they are development cost charges. In the US, development cost charges are usually termed exaction fees or impact fees.

Development cost charges evolved as an infrastructure funding mechanism only slowly. DCC fees started with the simple idea of having developers donating a portion of their development for open space. The concept then moved toward dedicating a portion of land for various public infrastructure. By the 1970s, developers in many cities were being required to donate land and also make a cash payment to cover the costs of providing new infrastructure to their developments, or constructing it themselves and donating the assets back to the municipality. Today, DCCs and their many variants are the most common means of financing growth-related infrastructure in most major Canadian and American cities.

Advantages

Development cost charges can be a significant source of new funding, particularly for those cities that are experiencing rapid population growth. As such, DCC fees directly address at least one driver of the infrastructure challenge. DCCs effectively shift the costs of funding new infrastructure to the developments that create the demand, allowing growth to pay its own way. DCCs also allow infrastructure provision to be synchronized with new development, and can also impose a measure of economic discipline on developers by requiring

them to absorb a portion of the public costs. DCC fees link decisions on development with the costs to the city in a practical way.

Development cost charges are generally viewed as a superior method of funding infrastructure to accommodate growth, especially when compared to using general property tax revenues. Property tax revenues do not always grow in proportion to the infrastructure costs imposed by new development, and they often materialize only after the infrastructure has been provided and the development completed. In large cities that are rapidly growing, using general property taxes to pay for new infrastructure in far-flung suburbs will eventually lead to anti-growth sentiments—existing taxpayers are subsidizing local infrastructure in the new development for which they receive only limited benefits in return. In addition, some new high growth areas have a limited property tax base that is simply unable to fund all the infrastructure needed. As such, DCC fees have proven to be more politically acceptable than a general tax increase to accommodate new growth, even though they are generally unpopular with new residents, realtors, and local land developers.

Development cost charges are generally seen as an equitable and efficient way to fund new infrastructure. DCCs are equitable in the sense that those who create the need for new infrastructure ultimately pay the cost of providing that infrastructure. By requiring those who benefit to pay, DCC fees are seen as the most efficient funding option (Irwin and Carpenter 2005). DCC fees are relatively easy to compute and also involve relatively low transaction costs.

Opponents often argue that DCCs act as a constraint on local economic development and they act as a de facto tax on capital, stifling investment and driving job growth and development to areas where there are no fees. Supporters counter that DCCs amount to an investment in the community, spurring economic growth through the timely provision of infrastructure. DCCs are not a tax, but a user fee, and the academic literature suggests that the aggregate benefits of DCCs improve upon the efficient provision of infrastructure without slowing job growth. DCCs facilitate infrastructure provision, which is a key component to ensuring an adequate supply of buildable land, and thus, economic development (Moody and Nelson 2003). If general property taxes were

required to cover the costs of growth, much of that growth would not occur. Because existing residents are reluctant to pay for it, new developments simply would not proceed.

When set properly, DCCs are likely the most effective and efficient way for new development to buy-in to the larger urban infrastructure system at a fair price, and also repay those who originally paid for that system. Another advantage of DCCs is that they can theoretically be applied to a wide range of new public infrastructure and be set to fully recover the costs of local infrastructure driven by population growth. The price charged is proportional to the impacts, and the fees themselves establish a clear link between those who benefit and those who pay.

Disadvantages

The most vocal complaint about DCC fees is how they increase the costs of new homes and may put them out of reach of those with low or moderate incomes. However, the impact of DCC fees is quite complex—much depends on the state of the local housing market, the policies of other local governments in the area, and the time frame involved. In the short-term, DCC fees may actually have no impact on housing prices at all, and may result in a lower profit to developers, builders, and the original landowner, or lower wages for the construction industry (National Conference of State Legislatures 1999; Adams, Cidell, Hansen, Jung, Ryu, and VanDrasek 1999). In a real estate market marked by high demand and low supply, DCCs usually result in higher home prices, but when the conditions are reversed, developers may have to absorb the cost.

In the long-run, however, it is generally the case that DCCs mean higher prices for new homes. But is this at all unreasonable? The price of a home cannot be divorced from the infrastructure it is sitting upon. The infrastructure is part and parcel of the functioning of the home. For the most part, DCCs appear to impose a reasonable cost. Most concern tends to centre around how they function in overheated market where the price of new homes is rising so fast that developers are making abnormally huge profits due to a housing shortage. Here, DCCs become problematic as they impose even further costs while developers are perceived as making large profits. However, these market conditions are also relatively infrequent and tend to be short-term in nature.

The equity and efficiency arguments for DCCs appear to be rather straightforward, but that appearance is often disputed and contested as well. Some argue that because DCCs impose all the costs of new infrastructure on new developments, this results in a windfall benefit to existing residents. This happens in three ways. First, because DCCs raise the value of new homes, they also raise the price of existing resale homes that act as a substitute. Existing homeowners do not pay the DCC fees, yet they do receive the benefits in the form of a higher home value. Second, existing residents do benefit from growth in the form of a stronger municipal tax base, overall economic growth, and improved job prospects as the city grows. Third, much of the existing infrastructure was funded by general property taxes and not DCC fees. While existing residents were the beneficiaries of a community-wide funding approach, today they are not being called upon to help new residents in the same way, and this is unfair. The equity effects here are complex and hard to sort out. But DCCs also rarely cover all the costs associated with growth. Most municipalities see them as a supplement to other alternatives (Dicker and Colo 1993). If this is the case, then existing residents likely do pay a portion of the costs of urban growth. In the end, much depends on the specific circumstances under which DCCs are charged, and how they are used.

Critics of development cost charges also argue that it is a more expensive way to proceed. DCCs are initially paid by developers, but they will eventually be capitalized into the price of new homes and slowly paid over time through regular mortgage payments. But governments can borrow at a lower interest rate than the typical home mortgage. A better alternative would be for government to borrow the funds, and apply a special assessment tax on new homes to fund the debt. This would lower the price of new homes (Lampert 2000).

The logic here is not entirely clear. The new home price is no longer inflated by DCCs, but they now carry a higher tax burden. While it is not exactly a straight exchange—governments can typically issue debt more cheaply—the approach fails to recognize an important fact. Most rapidly growing cities simply cannot borrow the amounts required to fund all the new infrastructure they need. Debt ceilings would likely be breached quickly. Thus, DCCs allow local governments to preserve debt capacity for infrastructure that cannot be funded through DCCs.

Perhaps the biggest concern with DCCs is that they only fund the up-front costs of infrastructure, not maintenance or eventual replacement. This is no small concern when infrastructure is viewed from a life-cycle perspective (Department of Transport and Regional Services 2002). When DCC fees are used to fund massive amounts of new infrastructure, consideration must be given to how the maintenance of that infrastructure will be covered, and where the funds will come to eventually rehabilitate or replace the infrastructure at the end of its life. In the absence of sufficient planning for the future, DCCs are funding a set of assets that will eventually turn into a huge liability when it comes time to replace those assets.

Winning Conditions and Applications

Development cost charges have been used in Canada for about 20 to 30 years (Canada Mortgage and Housing 1999; Infrastructure Canada 2004). However, DCC usage is not consistent across the country. As of 2002, only Ontario, British Columbia, Alberta, and Saskatchewan had DCC charges in place through some form of enabling legislation. At the time, Nova Scotia and Quebec were looking at developing a provincial regime of DCC charges. In other provinces, the usage of DCCs is more ad hoc and unregulated.

The traditional application of development cost charges has tended to centre around three features. First, the charges are uniform. Uniform development cost charges employ the same rate for any particular land use across a city regardless of the costs associated with providing infrastructure. Charges might vary between different types of developments (e.g., residential versus commercial), but the traditional practice has been to impose the same charge on the same development regardless of cost considerations. While this is administratively simple, it is not efficient. The cost of infrastructure is higher for lower density development and lower for higher density development. Uniform DCC fees can lead to the over development of low density residences and result in a more sprawling urban form.

Second, the standard practice with DCCs in most cities has to been to negotiate a set of fees for individual developments and specific infrastructure. This approach is suitable for large developments involving a wide range of infrastructure, but is arguably less appropriate for accommodating the

infrastructure needed to accommodate a pattern of regular and consistent growth. Negotiating a separate set of DCC fees for every development results in a time-consuming and expensive process that runs the risk of creating inconsistencies, uncertainties, and inequities—intended or not. When DCCs are always negotiated, developers find themselves working under a lack of standardized rules and regulations that may be open to abuse by either party. For cities with only a few developers and a few developments going on at any one time, the approach works well. For other cities, consideration should be given to a more standardized DCC system.

Third, the infrastructure funded through DCCs is generally limited. In Canada, the traditional DCC user fee is applied to new on-site infrastructure only—infrastructure actually located within the new development or directly adjacent and intimately related to the new development. Typically, this infrastructure has been of the hard or economic variety, encompassing local roads, traffic control and signage, sidewalks, pedestrian trails, bike paths, streetlighting, water and wastewater pipes, storm drainage, and local parks and open spaces. In some cases, DCCs may also be charged for collector roads and minor arterials that will connect new developments together, and also join to the existing roadway infrastructure.

The narrow range of infrastructure funded through DCC fees limits their potential as a funding source. DCCs can only be used for new infrastructure. They cannot be used fund existing infrastructure already in place, and under certain conditions, they can only partially fund extensions and upgrades to deficient systems (Smith 2004). At the same time, a significant part of the infrastructure challenge for many cities is in the renewal of existing infrastructure. Development cost charges are usually linked to highly localized infrastructure as well. Yet, some of the infrastructure challenge from new growth lies in needs that build up downstream. It is one thing to have the costs of hundreds of local streets directly paid by new developments themselves, but what about that new expressway or interchange now required two kilometers down the road, or the millions needed for an extension of transit? Finally, DCCs may have little to offer for those cities where growth occurs at a much slower and more relaxed pace, or where growth has stalled completely.

2.2.2. Innovative User Fees

Across the infrastructure community, three particular innovations with user fees stand out. First, local governments need to make better use of user fees by aligning operating and capital costs with the price charged through user fees. More rational pricing will increase efficiency, lower total costs, and keep the demand for infrastructure in check. Second, DCC fees should be employed more effectively. Third, local governments should be making better use of user fees by expanding them to encompass as many forms of infrastructure and services as they possibly can.

This consensus with user fees does not revolve around simply hiking the user fees now in place. This approach is handicapped by two factors. First, a good portion of the infrastructure shortfall lies in tax supported areas such as roadways. Traditionally, user fees have not been used to fund these areas. Thus, an expansion of user fees to these areas is the only way they can begin to contribute to the funding shortfall. Second, many user fees relate to the capital needs of utility operations. While utility fees could be increased to generate more revenue to fund capital, that would imply a violation of the principle of correct pricing. The overall price charged must not be too low nor must it be too high—that amounts to nothing more than a revenue grab.

Third, many fees tend to cover only a portion of the costs associated with a specific set of municipal services. Not only have these user fees generally shown limited potential for growth, to contribute they would have to be drastically increased relative to the costs of providing services. This carries a substantial downside. For example, recreation facility fees could be increased to cover all the costs of operations and capital with the tax savings then applied to other infrastructure needs. But usage of those facilities could decline as a result. If the facilities are not sustainable under full cost recovery, the facilities would have to close. In other words, the potential of user fees here cannot lie in simply hiking the rates. Rather, the goal is to aggressively pursue the accurate pricing of infrastructure and services and expanding their usage wherever possible.

A. PROPER PRICING

Many user fees are not being employed as a price signalling device. Most user fees do not capture the full cost of providing some services, and where they do, user fees do reflect marginal costs but average costs. Further, many municipal user fees do not take into account the costs of providing services during peak demand periods. In other words, user fees are employed to raise revenue only, as opposed to accurately pricing the costs of municipal services (Kitchen 1993). This approach needs to be reconsidered if cities are to secure the fiscal future of infrastructure. There are six innovations that cities can employ with respect to user fees.

Full Cost Recovery

If user fees are to accurately price the costs of infrastructure, they must include the costs associated with capital consumption or depreciation, as opposed to recovering operating costs only (West Central Initiative 2003). Not only should user fees cover current operating and capital needs, but they should cover future capital needs as well. Empirical evidence suggests that communities following a policy of charging for the full cost of water and sewer have more funds to invest in infrastructure upgrades, while those that charge less than the full cost cannot make the investments needed to maintain and improve their systems (Gore and Storrie 1999). Full cost recovery will also help check demand. Simple metering and a surcharge for wastewater can cause consumption to fall by 15-20%. Metering combined with price increases can cause a 30% to 40% drop in usage. The Ontario Ministry of Public Infrastructure Renewal (PIR) has recognized the benefits of this approach, and has stated that moving toward full cost recovery for water and wastewater services is a fundamental principle of its strategy for infrastructure. This principle can also be extended to other forms of infrastructure.

Marginal Cost Pricing

The efficiency of user fees is maximized only when the fees charged match the marginal costs of delivery—when the fee equals both the extra operating and capital costs of providing the last unit of a good or service consumed. This is not some theory that economists have dreamed up—it is simple common sense (Kitchen 2003). With marginal cost pricing (MCP), the user fees charged must be a variable—the charge

must increase according to the higher costs of delivering services and infrastructure to different properties. Rates do not simply depend on the amount of goods or services used.

Variable Unit Rates

For many utility-based services such as water and wastewater, cities need to consider moving to volumetric charges that vary according to the amount of water used and the operating and capital costs of delivering that water to different properties. As noted earlier, increasing block rates are the most efficient in this regard, but they are seldom used.

Multi-Part Tariffs

Where marginal cost pricing cannot be used or where it leads to an operating loss, the most effective substitute is a multi-part tariff. This type of user fee has a fixed or flat charge for accessing the infrastructure system and the service, and a variable fee that equals some approximation to marginal cost, which is far more preferable than simply using a constant unit rate that recovers the average cost (Kitchen 2003).

Peak Period Pricing

Although it has been used in the private utility industry for decades, peak period pricing is relatively unknown when it comes to municipal infrastructure and services. With peak period pricing, the price of user fees rise when demand increases at certain times of the day or during certain seasons of the year. Peak period pricing can be used for many services, including water and even transit. Peak period pricing includes such things as zone charges for transit that charge a higher amount depending on the distance travelled or higher fees during peak travel times.

Differential User Fees

Given that visitors often use a number of city services but pay their property taxes elsewhere, a strong case can be made for charging differential fees to non-residents that are higher than the fees charged to local residents. This approach is only practical for those services where outside users can be easily identified (e.g., recreation facilities, libraries, cultural facilities). A special citizenship card could be used to separate those who should pay less and those who should pay a premium for accessing certain services. This approach is quite common with municipal libraries, where non-residents are charged a higher fee for than local citizens. The City of Stillwater, Oklahoma, currently has extended the

idea to its utility services. The city follows a policy of charging customers outside the city 150% of the normal utility rate paid by customers inside the city. While the additional charge generates only an extra \$25,000 a year, it reflects an important principle (Tischler and Associates 1998). The downside of differential fees is how they work against the principle of proper pricing. However, it is often used for services that are based on partial cost recovery and are under priced in any event. In the absence of a general retail sales tax or a set of selective sales taxes, differential fees remains as one of the only ways to capture a small portion of revenue from visitors to the city.

Advantages

User pay bridges the growing gap between increasing demands for infrastructure expenditure and limited revenue by signalling to citizens and consumers the real costs of municipal services. Here, user pay is not about raising revenue, achieving full cost-recovery, cost-effectiveness or cost-containment. From an economic perspective, user pay is all about pricing and capturing the real costs of providing services to individuals and property owners in an attempt to increase efficiency and discourage the waste of expensive services and infrastructure (Kitchen 1993, 2000). Accurate pricing lessens the free-rider problem, helps stem urban sprawl as life in the suburbs becomes more expensive than living closer to the city centre, and provides cities with an escape route from the infrastructure revenue squeeze.

Accurate pricing dispels the notion that public goods are somehow free goods. To avoid increasing their own costs, consumers will begin lowering the amount of garbage they throw out and limiting the amount of water they use by inserting toilet tank infills of low-flow shower heads (Palda 1998). The savings could run into the millions of dollars as cities suddenly discover there is no demand for that new water treatment plant after all (Vander Ploeg 2002a).

Disadvantages

With respect to municipal infrastructure, full pricing comes with more than a few unknowns. Some argue that the type of user fee rate structure (e.g., constant or variable) actually has very little impact—the difference comes from the actual price charged (Gore and Storrie 1999). Thus, the focus should be less on rate structures and more on actual pricing levels.

Full cost pricing and marginal cost pricing is also difficult. It takes work. Municipal officials often agree that correct pricing is a laudable goal, but to do it they must first know what all the costs are. Such full cost accounting or activity-based accounting for different infrastructure and services is difficult, if not impossible. A range of soft costs are often shared across various service functions (e.g., overhead, buildings, insurance, training, office support) making full cost accounting more art than science. With respect to water, it requires metering at a minimum. It also requires knowledge about the full costs of capital as well as future asset replacement (Kitchen 2003).

Things like marginal cost pricing cannot be pursued if cities steadfastly refuse to set variable rates that reflect differences in infrastructure cost that arise from longer distances to supply or usage levels. In the past, grants have also encouraged various infrastructure facilities to be built much larger than what was needed, or to accommodate increased demand expected in the future. Until that increased demand arrives, using marginal cost pricing would produce insufficient revenue to cover costs. In such circumstances, pricing has to be intentionally lowered to encourage more consumption and generate enough revenue just to cover annual operating costs. In the end, marginal cost pricing is usually seen as unnecessarily complex, and if demand for an infrastructure or service is relatively inelastic, it will not have much of an impact. In short, average cost pricing is simply easier (Kitchen 2003).

Winning Conditions and Applications

The argument of better pricing to contain sprawl and end the over-consumption of infrastructure and services is compelling. But political realities are sure to intervene. Powerful forces and traditional pricing mechanisms exert strong control and work against more accurate pricing. The status quo is also defended on the grounds of distributional or vertical equity. In the minds of the public, efficiency is something for business to worry about, but government should concern itself with the public interest (Oakerson 1999). The issue is also surrounded by interests with significant sums at stake. Marginal cost pricing would essentially force many in the suburbs to pay much larger costs for a range of infrastructure and services. Since this constituency often represents the largest voting block, more accurate pricing faces a significant political hurdle.

Change of this magnitude requires a coalition of various interests to align and challenge the status quo. Here, it might be beneficial to combine accurate pricing with attempts at property tax reform—ending the over-taxation of commercial properties relative to residential properties and the over-taxation of multi-family housing relative to single-family housing. Because the same political barriers tend to work against both, a powerful moral argument can be made to flow when lower and modest income groups, business leaders, and environmentalists join to support better pricing and property tax reform. While these groups have traditionally possessed conflicting goals, their interests converge in a unique way when it comes to question of infrastructure pricing.

For example, lower and moderate income individuals tend to reside in multi-family dwellings that carry a higher effective property tax rate (even though the total tax bill may be lower) while middle and upper income individuals reside in single-family dwellings that are taxed at a lower rate. Lower and moderate income groups also tend to locate in belt-line areas surrounding the central core, and arguably subsidize the more expensive costs of infrastructure and services to the suburbs through the concept of average cost pricing. In all likelihood, middle and upper income property owners also use more city services. This reverse Robin Hood syndrome is a powerful incentive for lower and moderate income groups to join a coalition for change. Business leaders would also be interested—the business property tax is unrelated to profit and business properties are generally over-taxed relative to residential properties. Environmentalists would round out the group. Sprawl and the over-consumption of infrastructure and services generates very real ecological costs—the wasting of water, excess sewage, and high volumes of garbage (Kitchen and Slack 1993; Holle 1999; Palda 1998; Kitchen 1993).

In an article written in the *Globe and Mail* (April 4, 2001), former Toronto Mayor David Crombie explains that the ideas behind smart growth are not new and that it is a unique coalition that is driving urban change in the US: the Sierra Club, the National Association of Home Builders, and the Urban Land Institute found themselves using much the same language and promoting some of the same goals.

More accurate pricing could result in dramatically increased costs in certain areas and lower costs elsewhere, leading to significant fiscal dislocation. Combined with the political

difficulties, this means cities will have to make rational pricing with user fees a longer-term objective—the approach must be one of gradual change. In the interim, the case for better pricing must be developed, and the arguments repeatedly articulated. Cities must also begin learning the tools of activity-based accounting and begin collecting information on the costs of various infrastructure and services. Better pricing depends on accurate and complete accounting and budgeting, and financial information retrieval systems (Kitchen 2003). While this takes work, cities across Europe and the US are focusing on more rational pricing of their infrastructure and services. To assist with this, they have developed complex pricing models that help estimate these costs (Goldsmith 1998). The transfer of this knowledge is a clear prerequisite for moving better pricing models further down the road.

City officials must also begin identifying those infrastructure and services that are the best candidates for more rational pricing, and begin test projects experimenting with full cost recovery and marginal cost pricing strategies. Good candidates include water and wastewater systems, and most other forms of marketable infrastructure that carry the fewest concerns with vertical equity.

Particular emphasis should be placed on a service or infrastructure asset that is under-priced and has either promoted urban sprawl or led to over-consumption and increased infrastructure demand.

Full cost recovery and marginal cost pricing are not an option for all municipal infrastructure, particularly those with strong public good characteristics, large fixed costs, and low variable costs. Again, dramatically increasing transit fares would result in a falling usage, aggravating transportation problems elsewhere and hurting lower income citizens who tend to use transit more heavily. But neither is the concept of marginal cost pricing completely irrelevant. Instead of always looking for ways to better support transit, marginal cost pricing would have cities turning their gaze elsewhere, such as better pricing of its main competitor—the private vehicle driving on the tax-funded free road. Better pricing of roadway infrastructure—which generates huge social costs in the form of increased pollution and traffic congestion—would place transit infrastructure on a better funding platform. Things like toll roads, higher parking fees, and surtaxes on public parking can all help in this regard (Kitchen 2003). All of this involves a deliberate expansion of user fees, an innovation to which we now turn.

B. DEVELOPER COST CHARGES

The City of Ottawa's long-term financial plan asserts that new growth must pay its own way. As such, development cost charges should be raised to the highest levels feasible (City of Ottawa 2005). The assumption behind this policy recommendation is that Ottawa's DCC fees are too low. The extent to which this occurs across Canada is unknown, but two international examples offer some insight. In Australia, where debate over DCCs has raged for years, new homes in West Sydney may have to pay upwards of \$50,000 (AUD) to cover the costs of infrastructure they require. A new levy recently proposed could affect some 150,000 homes to be built in the northwest and southwest of Sydney over the next 25 years. The new land recently released for development will require \$7.7 billion (AUD) worth of infrastructure, including water and wastewater, roads, streetlights, local parks, libraries and transit (Skelsey 2004). In the San Francisco area, a recent study found that DCCs on new homes ranged from \$20,000 to \$30,000 a piece, or 19% of the mean sales price (Public Policy Institute of California 1997).

Increasing the level of DCC fees may be warranted, but they should never be set to exceed the costs of the infrastructure that needs to be provided. The emphasis with user fees is not to charge the most you can, but to accurately price infrastructure to individual users or certain groups of users. With that goal in mind, there are eight innovations with DCC fees that offer some potential when it comes to new infrastructure.

Variable DCCs

To be the most effective and efficient, DCC fees should be set to recoup the variable costs of providing infrastructure to different developments and properties. When DCCs are rationally priced, developers will factor the costs of public infrastructure into their decision-making. When DCC fees are absent, or where they are uniformly applied, developers are more free to locate developments without thinking about the infrastructure costs. Variable DCC fees not only generate revenue, but they can steer growth to areas where infrastructure is under-utilized, and away from areas where providing it would be much more expensive (National Conference of State Legislatures 1999).

The costs of new infrastructure vary in a number of ways. The level of density is one consideration, as is the potential to re-use or maximize the usage of existing infrastructure.

Distance from major infrastructure facilities such as water and wastewater treatment is also a factor. A variable DCC system would carry higher fees for low density suburban development, and lower fees for higher density suburban development. DCC fees would be the lowest for high density developments that are close-in and tap into existing infrastructure, such as infills. Brownfield redevelopments might be exempted altogether.

Again, all of this implies a shift away from the average cost pricing model toward a marginal cost pricing approach. For reasons of administrative ease, many cities simply choose to base DCC fees on the average costs even though the approach is inefficient and may promote an over-supply of low density development (CD Howe 2002; Tomalty 2000). But if cities are at all serious about curbing sprawl and the higher infrastructure costs that it produces, then a rethinking of development cost charges is in order. Efficiency requires variable DCC rates based on capacity considerations, location, distance, and density. It depends on making individual properties of a new neighbourhood pay a charge that reflects the actual costs of its development (Kitchen 2004).

Expanded On-Site DCCs

DCC fees are typically levied for hard infrastructure that attaches to specific properties in a new development—local roads, sidewalks, streetlighting, water and sewer, storm drainage, signage, and traffic control. Theoretically, DCC fees do not have to be limited to this infrastructure alone—they can be expanded to include more items. Across the US, a long list of other infrastructure funded through DCCs include bus stops and turn-outs, transit stations, fire halls and police stations, outdoor recreation facilities, multi-use recreation centres, and libraries. This infrastructure does not directly attach to individual properties, but it is typically located on-site or adjacent to most new developments. Since this infrastructure will largely serve the new development, the DCC approach is applicable.

Expanded Off-Site DCCs

A sharp distinction is made in the US between development exactions or Type-1 DCCs used for on-site infrastructure, and the impact fee or Type-2 DCC that is a cash payment to offset the costs of upgrading or providing new off-site infrastructure forced by new development. While on-site DCCs (exactions) and off-site DCCs (impact fees) are often confused with one

another, the two are quite different. The standard for the traditional on-site DCC is paying for infrastructure that directly benefits the development. The purpose of the off-site DCC is cost impact mitigation. New development always implies a set of infrastructure needs that build up downstream—expanding urban expressways, upgrading major and minor arterial and collector roads, new interchanges, overpasses, and transit extension. In the US, off-site DCCs have also been used for land acquisition, the purchase of right-of-ways for new roadways, parking facilities, and recycling and solid waste collection facilities.

In the US, 22 states have allowed local governments to adopt impact fees (Duncan Associates 2000). While usage in Canada is unknown, some provinces are moving to consider this tool. For example, a recent amendment to Alberta's Municipal Government Act allows cities in that province the right to apply additional DCC fees to extend transportation infrastructure into rapidly developing urban areas (Vander Ploeg 2004a).

Off-site DCCs essentially require developers to pay a pro-rated share of the cost of new infrastructure facilities prompted by new development. The assumption here is that any incremental need for downstream infrastructure can be measured, and further, that the needs of both current and new residents can be isolated, and identified. But this is an unproven assumption. The biggest question around off-site DCCs is how to arrive at a rational nexus—determining the relationship between a new development and the infrastructure costs downstream, and ultimately, the share that should be charged to new developments through a DCC fee and the share that should be funded by the broader community out of the general property tax base. In the US, DCCs have proven quite controversial because arriving at a suitable formula for sharing costs is fraught with difficulties.

Linkage DCCs

Traditional DCC fees are levied only for on-site infrastructure of the hard variety. The idea of impact fees for off-site hard infrastructure extends the idea further. Recently, some US cities have also begun experimenting with linkage fees—special one-time DCC charges on specific developments for soft social infrastructure such as correctional facilities, general government buildings, affordable housing, seniors' lodges, health clinics, schools, day cares, and the preservation of historic buildings.

In the US, the City of Boston was one of the first to implement a linkage DCC fee. Boston required all commercial developments exceeding 100,000 square feet to pay a one-time fee of \$5 for every square foot in excess of the 100,000 limit. The DCC was collected once the new development was occupied, and the funds were to go to a neighbourhood housing trust to fund homes for low and middle income individuals. The rationale for the fee was that the new construction of commercial and industrial space creates a need for affordable housing.

Such fees seem to be proliferating in the US, and have become quite controversial. Oftentimes, the infrastructure or service being funded has a community-wide benefit, and the relationship between the development and the expenditure is very weak. From an economic and efficiency point of view, such fees are not fees at all—they are a tax on development. The benefits of such linkage fees—from an efficiency standpoint—is highly questionable.

Density Bonusing

Density bonusing type fees can take many forms, but it is essentially a variable DCC arrived at through negotiation. In some ways, it represents a different variety of the linkage fee. With density bonusing, a local government agrees to re-zone a property that allows the owner to put it to more valuable use, such as building a condominium or other high density development. In return for the re-zoning approval, the developer agrees to help fund, or even provide, various infrastructure and facilities. The developer is essentially returning a portion of the increase in value that the land experienced as a result of a zoning decision. Density bonusing is not very widely used, and some argue that it results in bad planning and the process can be open to abuse. In Toronto, the City used density bonusing to get new daycare facilities built, and also to help fund the restoration and preservation of several historical buildings. Density bonusing, like linkage DCCs, are often used to fund off-site infrastructure only weakly related to the development. As such, density bonusing is more a form of value capture taxation than a DCC fee proper.

DCCs for Future Maintenance and Replacement

A specific disadvantage of DCC fees is that they cannot cover the costs of maintenance, rehabilitation, and the eventual replacement of the new infrastructure assets they fund. At the same time, most infrastructure analysts suggest that the

full cost of infrastructure must not be limited to initial costs only—future costs of maintenance and eventual replacement must also be considered (Tischler and Associates 1998). Thus, funding infrastructure solely through DCC fees and failing to account for future costs means one is assuming a huge future liability, with no immediate source of funding to manage that liability. Some have argued that various DCC charges should include, at a minimum, some notional amount related to future infrastructure renewal, rehabilitation, and replacement.

But DCC fees cannot be structured to fund increased operating costs and maintenance of new systems. While a reserve could theoretically be struck to help with future replacement, it would more than likely be insufficient. As opposed to innovating in this direction, the better answer lies in the more rational pricing of system operations through appropriate user fee structures, the use of local improvement levies, and practices that accurately account for depreciation.

Front-Ended DCCs

The concept of front-ending allows infrastructure to proceed in advance of new development. Under front-ended DCCs, developers provide the municipality with the necessary funds to build new infrastructure, or simply provide it themselves. The concept of front-ending is beneficial when a new development is ready to proceed, but the lack of infrastructure is holding it up. The funds provided by the developer are usually repaid over time as other developments proceed and DCC charges are collected. Under some situations, the developer recoups the cost as other development tie into the infrastructure they funded. Both Calgary and Edmonton have used front-ended DCC arrangements. In 2001, developers in Calgary loaned \$30 million, interest free, to the City for transportation infrastructure. In exchange, the City lifted a development cap in a specific area (Heyman 2001). Edmonton also front-ends the construction of trunk sewers and associated systems in new developments.

When using this approach, appropriate safeguards need to be put in place. Cities will have to stress that the desire is to secure better timing for receiving funds—the approach is not a covert plan giving developers the right to set municipal planning and land-use policies, or to exploit the city's right to approve new development. Appropriate procedures need to be put in place to ensure the integrity of the municipal planning process.

Scheduled DCCs

A simple administrative change with DCCs is to develop a standardized fee schedule, especially when growth is continual and regular, and many different developments are occurring. This avoids the need to negotiate a separate set of fees for each development, and brings a level of certainty and specificity to the process. In developing a schedule, various stakeholders should be represented, including developers, builders, city officials, and other community leaders. The schedule should include the principles and objectives behind the DCC program and the rules should be clearly spelled out, including how fees will be determined and collected, as well as other administrative questions. To ensure that DCCs do not work at cross purposes with other long-term planning objectives, the schedule should be integrated within other comprehensive planning documents. The overarching purpose is to create a DCC process that is transparent, predictable, and accountable. A regular review and updating of the fee schedule should also be conducted.

Advantages

The innovations above are designed to provide three benefits. First, things like variable DCC fees promote marginal cost pricing, which leads to less waste, less urban sprawl, less infrastructure, and lower total costs. Other innovations extend the DCC principle in such a way that they can fund the widest range of infrastructure possible, or provide the funds when they are needed. Administrative innovations are designed to increase transparency, consistency and predictability for the developers, builders, and municipal governments.

Disadvantages

If one believes that new developments should pay for themselves, then extending the use of DCCs to new forms of on-site and off-site infrastructure is more than reasonable. However, it also requires significant effort to ensure that the fees charged actually reflect the costs imposed. If they fail to do so, the charge will act more like a tax on development. Further, the reaction of developers is not likely to be positive and the cost of new housing will increase. Development charges cannot become too high, as this could encourage development to move to adjacent communities that charge lower fees. More development in metro-adjacent communities implies greater problems with fiscal disequivalence across a large city-region. Not only would the central city lose DCC revenue, they would be forced to provide more infrastructure

for commuters and visitors who are not paying for it (Connery 2003). Expansion of DCC fees can also make a city dependent on development, which can skew municipal planning. In most cases, provincial approval will also be required for significant innovation with DCC fees.

Winning Conditions and Applications

Any system of development cost charges needs to be well thought out and rationally defended. This has not always occurred in the US. When considering expansion of DCC fees, feasibility studies need to be conducted and involvement with the development industry procured. In all cases, the nexus between the fee, the development, and the infrastructure project must be clear, transparent, and defensible. Expanding DCC fees may also require a regional approach to the question. In the end, the potential of innovating with DCCs is not unlimited. Existing residents can also benefit from growth, and this may mean at least some partial sharing of the costs.

C. CONVERTING CURRENT TAX SUPPORTED INFRASTRUCTURE TO USER PAY

At the heart of innovative infrastructure finance is the concept of converting infrastructure traditionally funded by taxation into a user pay system. This can occur in one of two ways. First, an infrastructure funded by general taxation can be funded with a user pay tax. Instead of funding roads through the general property tax, they would be funded through dedicated a fuel tax and vehicle registration fees. A second, and more robust form of innovation, takes infrastructure funded by general taxation or a user pay tax and funds it through a direct user charge. The classic example is funding roads, bridges, and tunnels through a toll.

Advantages

The shifting of infrastructure to user pay is a fundamental principle of innovative infrastructure finance. Across the globe, most of the infrastructure challenge lies in tax supported systems—particularly transportation. Moving this infrastructure to user pay attacks the funding challenge head-on. To the extent that infrastructure traditionally funded through taxation can be converted to user pay, the funding challenge is easily met. Consider new infrastructure. When new infrastructure is constructed on a completely self-sustaining basis through user fees, the stock of infrastructure

is increased with no direct financial cost accruing to government. The infrastructure survives on its own cash flow, and current tax dollars and future tax capacity is preserved for other projects that cannot be funded through a user pay approach. Converting tax-based infrastructure to direct user pay eliminates all the disadvantages that come with tax-based funding, and pulls in all the advantages of user pay funding. Based on the preceding discussion, the advantages from a financing and funding perspective are legion.

Disadvantages

The classic argument against converting tax-based infrastructure to user pay revolves around a set of new problems that this approach can create. For example, if solid waste collection is converted to a complete user pay system, some will try and avoid that user fee by illegally dumping their garbage. Roadside ditches filled with old refrigerators and mattresses are a vivid reminder of the externalities produced by goods and services that possess strong public characteristics. When user pay is attached to these types of infrastructure and services, other counteractive mechanisms may be needed to mitigate such problems. Typically, this takes the form of additional regulations and stepped-up enforcement. Both imply at least some additional cost.

Winning Conditions and Applications

The types of infrastructure that can be funded strictly on a user pay basis are limited. Regardless of the other characteristics that an infrastructure asset might possess, it must be marketable for user fees to work. But marginally marketable infrastructure is also a candidate. Here, user fees that partially recover cost can be implemented, with a tax subsidy used to cover any shortfall in funding. A key consideration here is also municipal infrastructure and services that compete with similar services offered in the private sector. Municipal golf courses are a classic example. Such infrastructure and services should always be provided under a strict user pay system with full marginal cost pricing and no direct or indirect subsidy.

Converting existing tax-funded infrastructure to user pay is easiest when it involves an entirely new infrastructure system. With new infrastructure, the user pay approach can be defended and win general acceptance if a strong case can be made that the infrastructure simply would not proceed unless a user fee approach is taken. It is much more difficult

to convert existing tax-based infrastructure, since the public will resent having to pay for what used to be free. When it comes to existing infrastructure, a key winning condition is to first make a series of improvements and upgrades, or even rehabilitation or replacement, and then convert the infrastructure to user pay. In essence, the idea is to make the old infrastructure function like new, and employ user fees as the source of funding. The idea of putting a new user fee on an existing system—particularly one that is deteriorating and is highly visible—is a non-starter.

Under a larger program of user pay conversion, some may also start to wonder why their property taxes are not going down while more and more user fees always seem to be popping up. Such complaints, which are sure to arise, need an effective response. Citizens need to understand that if user pay were not implemented, property taxes would be rising instead of staying the same. If tax increases nor user pay are welcomed, then infrastructure simply will not be built, and existing systems will continue to crumble. To build support, it might also be beneficial to hold the line on property taxation or limit future increases. In this way, the public can be reminded of some of the benefits of a strong commitment to a user pay approach.

Scanning across the municipal infrastructure landscape, there are five particular kinds of municipal tax-funded infrastructure and services that can be converted to a user pay approach.

Water Treatment and Distribution

To the extent that various municipalities subsidize their water supply, treatment, and distribution infrastructure and operations with property taxes, that should be converted to complete user pay as soon as it is practical, with a particular emphasis on full cost recovery and marginal cost pricing principles. Water infrastructure generates significant private benefits, produces few externalities, and typically involves few issues with respect to distributional equality. Whether one looks at Europe, the US, Southeast Asia, Australasia, or Canada, water infrastructure can be successfully financed with debt and funded on a complete user pay basis.

Wastewater Collection and Treatment

Sanitary sewer infrastructure and its related operations can also be funded on a user pay basis. While it is difficult—if not impossible—to directly measure the amount of wastewater

generated by individual users, wastewater fees can still be set based on the amount of fresh water consumed. With this approach, wastewater charges take the form of an indirect fee or user tax. Again, there is little reason why general taxation must fund this infrastructure.

The City of Vancouver recently came to the same conclusion, converting its sewer operations into a user pay utility service in 2000. At the time of conversion, only 22% of the costs of the wastewater system were being derived from user fees. The remainder was funded with general property taxes. By 2001, the sewer system is expected to be funded 45% by user fees. For cities like Vancouver, the eventual goal should be full cost recovery using the principles of marginal cost pricing.

It is on this last point where most municipal wastewater user fees fail to make the grade. While the infrastructure and service is covered on a user pay basis, most of the user fees follow an average pricing model with a flat fee unrelated to the amount of wastewater produced. In Ontario, for example, almost 60% of municipalities charge a fee for wastewater, but it is a flat fee. Once again, this violates the principles of rational pricing. A more optimal user fee structure would consist of a multi-tariff rate combining a flat connection fee to cover fixed costs, with a variable fee related to water usage. The flat connection fee can also be set higher for service areas that are further from the wastewater treatment plant to cover the additional costs of infrastructure such as sewer piping and lift stations (Kitchen 2003).

Storm Water Drainage

Storm water drainage infrastructure has recently emerged as a potential candidate for user pay funding. Again, the amount of water run-off cannot be metered, but an indirect user fee can be structured based on the square footage of properties that tie into the storm water system, with the fee appearing on utility bills and the revenues earmarked for drainage infrastructure. To ensure the most optimal pricing strategy, the fees could also be varied according to distance or other relevant factors. For example, some US cities provide for lower storm drainage fees for properties that adhere to special landscaping regulations or employ various permeable materials that reduce the amount of storm water run-off.

Storm drainage utilities are becoming increasingly popular south of the border. Storm drainage utilities have been created in Kansas City, Missouri and Des Moines, Iowa, and

many other cities are actively conducting feasibility studies (Duncan Associates 2000). In the US, user pay storm water infrastructure is sometimes funded through independent storm water districts. In Canada, the City of Regina was the first major city to convert its storm water infrastructure to a separate utility. Since 1992, the City of Regina has charged storm drainage fees based upon estimates of property area. In 2003, the City of Edmonton followed suit. But these are the exceptions. Across Canada, then, there is significant potential to employ more rational pricing with regards to this type of infrastructure.

Solid Waste Collection and Recycling

Given growing environmental awareness, solid waste infrastructure—particularly landfills—has drawn significant attention. Waste collection is a great candidate for a user fee approach. The users can be easily identified and the per unit operating and capital costs easily calculated (Kitchen 2003). While a user pay approach for solid waste has the potential to produce some negative spillovers such as illegal dumping, most of them can be controlled. In addition, the potential for these problems has been greatly reduced given increased environmental awareness.

User pay for solid waste and landfills has the potential to reduce the amount of refuse produced and to increase recycling. Recycling services can also be provided on a user pay basis or privately delivered. Solid waste infrastructure is generally only a small component of a city's overall infrastructure profile, but it would remove one service from the tax base and put the onus on those who pollute the most. If a user pay system can lower the volume of garbage, municipalities might also realize savings on landfill costs.

Despite the potential, few municipalities fund their solid waste operations on a user pay basis. A 1997 survey of 327 Ontario municipalities showed that the great majority fund solid waste collection out of general property taxes. While 22% did employ a user pay approach, most of these fees were a simple flat rate charge attached to utility bills that were unrelated to the volume of garbage produced. Only 2.4% of the municipalities surveyed used pre-paid tags—a user fee—to fund all or part of solid waste collection and disposal. Only 0.9% said they used user fees exclusively. The others used pre-paid tags only for collecting waste that exceeded the municipal bag limit (Kitchen 2003).

From both an economic and an environmental perspective, there is little justification for solid waste and recycling to be funded through taxation. A set of solid waste user fees can be easily constructed that covers the operating and capital costs of collection and processing, as well as the costs of landfills, including both closure and post-closure costs and an estimate of the environmental costs (Kitchen 2003). Some municipalities, like Clinton, Ontario, have experimented with a system of pre-paid tags offered for sale in various locations such as grocery and convenience stores. As a start, cities could institute bag limits and require pre-paid tags for bags exceeding the limit.

Roadways, Tunnels, Bridges

The conversion of roadways, bridges and tunnels from tax-based funding to user pay is controversial. At the same time, it is the most relevant type of infrastructure to consider for user pay funding. Not only does it represent the largest public infrastructure investment in modern industrial history, but the reported funding shortfalls run into the billions of dollars. Traffic congestion, the costs of subsidizing transit, continual demand for more roads, and the infrastructure deficit in transportation are major urban challenges. What is more, most of this is directly related to a lack of price signals. Various options, such as reverse lanes and high occupancy vehicle (HOV) lanes, are often suggested as a way to mitigate transportation problems, as are community ride-and-share programs and other transportation demand management (TDM) strategies. But none of these chop into the root of the problem—inadequate pricing.

Pricing roadways has several advantages. Tolls create a new source of revenue while keeping demand in check. Reduced demand, in turn, means less congestion and pollution. Pricing roads will also make public transit more attractive. As long as transit is forced to compete with the free road, it will always require huge subsidies. Tolls encourage car and van pooling to share the costs. The tolled road is one of the most difficult infrastructure assets to convert to user pay, but it also holds the most promise for changing destructive transportation habits, creating more liveable and environment-friendly cities, and placing infrastructure on a more financially sustainable path.

The free road has traditionally been viewed as a public good that yields significant private benefits, but it simply cannot be

priced. Roadway infrastructure is the classic case of build it and they will come. Once the roadway is provided, it is impossible or too expensive to restrict usage to those who pay, and in the urban context, the sheer availability of other routes allows drivers to escape the charge. As a result, tolls have traditionally been ignored as a viable option despite the huge free-riding problems they create—the steady stream of vehicles freely commuting and polluting cities on someone else's property tax dollar.

But all of this is rapidly changing. The tolling of road-related infrastructure across Europe, Southeast Asia, Australasia, and the US is virtually exploding, turning many public roadways into a full cost recovery enterprise. Roads, bridges, and tunnels the world over are being constructed and rehabilitated on a self-funding basis, with the initial capital costs financed by debt, and the debt funded directly by the users, many of whom choose to pay the toll to avoid the congested alternative.

Much of this growth in tolling is a direct result of two factors. First, technology has lowered the transaction costs associated with identifying users. The rapid expansion of new digital technology and global positioning systems (GPS) has allowed for the production of intelligent transportation systems (ITS) and electronic toll collection (ETC) on roadways adjacent to and within urban regions. Electronic tolling is now installed on almost 75% of all US toll roads, and is even more common place in Europe (ZVEI 2005). The recognition of vehicles is conducted through electronic transponders. Once a vehicle enters a tollway, pre-paid credits paid into individual toll road accounts are electronically deducted. Those without transponders are captured on camera, and billed through the mail. Other alternatives include smart cards that can be used for transit and various toll roads, which combine to form an integrated transportation pricing system. Customers can add credits on the cards at gas stations and convenience stores. Across the US, the technology comes with names like E-Z Pass and FasTrak.

Second, there is a growing recognition that the conventional tax-funding approach to transportation is a fiscal and environmental death spiral. In private markets, increased demand results in increased revenues for the producers of goods and services. This prompts, and also helps fund, an expansion of supply. This is not the case with the un-tolled

road. The low cost of transportation to the individual user sends out a signal that encourages driving, even to the point where road capacity is strained. The congestion prompts public authorities to build more road infrastructure. But because the individual users are still not paying the full cost of the expansion, the same price signal is sent again. The additional capacity encourages new users who once again use it up (Puget Sound Regional Council 2002). This vicious circle has met with public resistance to tax increases and more public debt and tolling is seen as an effective way out of it.

The Canadian experience with tolling is restricted to a handful of examples. The Coquahalla Highway in British Columbia, constructed in the late 1980s, was the first modern tollway built in the country. Highway 407 in Toronto came a decade later, and still remains as Canada's foremost example of the modern urban tollway—user pay and privately owned and operated. The 407 is a 100 km stretch of highway accommodating an average of 37,500 vehicles a day. The Fredricton-Moncton Highway, the two bridges connecting Halifax and Dartmouth, and the new Confederation Bridge round out the Canadian experience. Usage elsewhere is more common. As of 2005, tolls were either being used or considered in 32 US states (Leahy 2005). Tolloed infrastructure also exists across Europe, including the UK, France, Spain, Norway, and Sweden. Australia has some of the largest toll projects in the world.

Over the last decade, there has been increasing sophistication with the idea of tolling, and an impressive literature base has begun to emerge. From an implementation perspective, the one crucial rule with road tolling is to always keep an alternate route available at no charge. The presence of an alternate route ensures that no one is worse off with the new toll road. Those who choose to pay can avoid congestion and drive on an upgraded road. In that sense, those who pay are better off. But if congestion is lowered and excess toll revenue is used to fund other non-tolloed roads, everybody is better off. With that said, the concept of tolling can refer to six different approaches.

Direct Tolling: Direct tolling, or real tolls, charge all drivers a direct user fee every time they use the road. These tolls are usually a flat fee, although some do vary according to the distance driven. The application of new technologies is

critical to a direct tolling initiative as it lowers the costs of identifying individual drivers. Direct tolling can be applied to certain congested sections of an integrated roadway system that have been carved off for user pay, and also used for entirely new integrated roadway systems. Direct tolling is most suited for new infrastructure or existing roads that have been rehabilitated and function as new infrastructure. To succeed with direct tolling, the tolls must be set at an acceptable level. It also requires careful forecasts of future traffic estimates.

Variable Tolling: Variable tolling, congestion pricing, and value pricing all refer to toll roads where the toll is varied in real time when congestion begins to slow traffic. Variable tolling can be implemented in a number of ways, but the typical approach is to set a low toll, or even no toll at all, during non-peak travel times, and implement a toll or increase the toll during peak travel times. Variable tolling is a sophisticated form of direct toll specifically designed to eliminate congestion as its first objective. The raising of revenue is a secondary consideration. The prime intent is to encourage drivers to seek alternate routes of travel, shift their time of travel, or use other alternatives such as transit or car pooling.

Indirect Tolling: The shadow toll or indirect toll is an innovation used in conjunction with PPP arrangements. Under a shadow toll arrangement, a public-private partnership or special purpose vehicle (SPV) corporation is struck to undertake the design, financing, construction, and operation of a new roadway. The government partner compensates the private partner based upon the number of vehicles using the road. Here, users are not paying the toll; the government pays the toll on behalf of the users.

Shadow tolling is a second best alternative for direct tolls. They are most often used to fund extension and upgrades to existing road systems rather than new roads, given the difficulty of applying tolls on roads that used to be free, or where an alternate route is unavailable. Shadow tolling is also used for inner city roads, which are more difficult to directly toll, and tunnels and bridges with lower traffic volumes. Shadow tolling can also serve as a first step before moving to direct tolls.

With shadow tolls, the usage of the infrastructure is not affected. Shadow tolling, like direct tolling, also produces

data on road usage levels by vehicle type, time of day, etc. All of these data can be beneficial in optimizing maintenance schedules and preventing problems as opposed to reacting to them, but the main advantage is how a portion of the risks involved can be transferred to the private sector. With shadow tolling, governments can transfer some of the financing risk, construction risk, revenue risks, and operations and maintenance risk to the private sector partner. Shadow tolling is generally restricted to Europe, primarily the UK. However, the Fredricton-Moncton Highway is a shadow toll arrangement.

Partial Tolling: Toll road projects entail significant revenue risk—the chance that anticipated usage will not materialize at a tolling level sufficient to fund the debt undertaken to finance the project. For any given toll project, a certain critical mass of vehicles is required relative to the distance of the road, the total cost of the infrastructure, and the maximum toll that will be acceptable. For example, a stretch of roadway requiring \$100 million in annual debt service will need to generate \$275,000 per day just to cover the interest and principal, never mind operations and maintenance. If the maximum toll that can be born is \$2.50, over 110,000 cars a day will need to use that road for it to be self-funding. With a \$5 toll, 55,000 cars are needed. As the price of the toll goes up, the number of vehicles goes down. Toll roads involve complex relationships, and there is always the risk that not enough vehicles will travel at a toll level sufficient to fund the new roadway.

In the US, there have been some highly publicized failures. A number of toll projects intended to be self-funding through various PPP arrangements have run into considerable financial difficulties, requiring a government subsidy or a refinancing of the debt. The Dulles Greenway in Virginia is a classic example. This 25 km four lane stretch of road was built through a PPP at a cost of \$338 million (US). The tollway opened in 1995, but the projected revenue failed to materialize. As a result, the private operators defaulted on their bond obligations. In 1999, the entire project had to be refinanced. However, with weekday traffic on the Greenway now exceeding 45,000 vehicles per day, the project appears to be in better shape financially, and an expansion began in June 2000.

Given these difficulties, should cities simply throw their hands up and continue with current practices? Not at all. The

concept of partial tolling can help. Under partial tolling, the user fees collected recover only a portion of the operating and capital costs, with a subsidy covering the remainder. Partial cost recovery is better than no recovery at all, and it still charges a direct fee to users. The subsidy can be funded from fuel taxation or some other user tax, or by distributing the profits earned on more successful toll roads to less successful toll roads. France has had a system of road tolls in place since 1955, with the present system dating back to 1970. By 1998, tollways in France accounted for 76.4% of all motorways in the country. Most of these are under concession agreements to private operators through a PPP arrangement. France cross-subsidizes less successful toll roads with excess revenue from the more successful toll roads (Inland Transport Committee 2003).

Many of the problems with tolling comes when governments promise the public that the road will be self-funding and will have no draw on the tax base. But these guarantees do not always materialize. When constructing toll roads, governments should always be prepared with a contingency plan to offer some kind of subsidy if toll revenues do not materialize, and also be prepared to restructure and refinance these projects. In the case of a PPP arrangement, governments need to be prepared to lengthen the concession agreement for operation of a toll road if the project is generating insufficient toll revenue. A longer concession period allows the private partner more time to repay the borrowings and earn a reasonable rate of return relative to the risk that has been undertaken.

Cordon Tolling: Many toll roads are specifically designed to accommodate inter-city traffic within massive urban areas. As such, many tolls in Europe, the US, and Australia are either state or central government PPP projects, as opposed to an option that cities themselves pursue. As a concept, tolling may have limited application, being largely restricted to large urban expressways. On the other hand, the idea of cordon tolling, or congestion charging, has direct application to cities. With a cordon toll, areas of a city experiencing congestion are cordoned off to traffic, unless a toll is paid to enter the restricted zone. Typically, cordon tolls are applied in central business districts or downtown cores of large urban centres.

The main objective of a cordon toll is to reduce congestion, not raise revenue to fund a road network. Cordon tolling is

Tolling the Road: Some Examples

Direct Tolling: Between 1988 and 1998, the vehicle miles traveled in California increased by 21%, yet the road network grew by only 1%. This imbalance between supply and demand has more than doubled the number of hours of delay on urban roads costing the economy an estimated \$2.8 billion annually in terms of lost time and added fuel costs. The California Air Resource Board estimates that this congestion produces 2.5 times more volatile organic compound emissions and results in an additional 418 tons of pollution being pumped into the environment each day (Dowall 2003). As a result, California is emerging as a leader in tolling. High profile projects include the SR-91 express lanes near Los Angeles and the I-15 HOT lanes near San Diego. Across the US, there are currently 5,000 miles (8,200 km) of tolled roadways. One of the world's largest direct tolling projects is in Melbourne, Australia. In 1994, the Melbourne City Link Authority was established as a public-private partnership to finance and construct a \$1.3 billion (US) road network running through the heart of the City. The network, at a combined length of 22 km, was started in 1996. As of 2000, over 520,000 transponders have been issued. The road attracts 340,000 vehicles daily.

Variable Tolling: California has not simply tolled the road, but is experimenting with variable rates that rise or fall in real time based on levels of congestion. Both the SR-91 and the I-15 are tolled with variable user fees. The two roads are part of a US federal road pricing pilot program funded in part by grants and built through various PPP structures. Both roads employ electronic toll collection. The idea is to encourage people to shift their travel to off-peak periods or use an alternate route, mass transit, or car-pooling. For the SR-91, additional lanes were constructed in the median of an existing roadway at a cost of \$126 million. Drivers can use the existing lanes or shift to the toll road. These express lanes attract 30,000 vehicles a day, or about 15% of the local traffic. In San Diego, legislation was passed in 1994 that allowed SOVs (single occupancy vehicles) to drive on existing HOV lanes (lanes reserved for high occupancy vehicles) if a toll was paid. These new HOT lanes (high occupancy toll) were the result of a 3-year federally funded demonstration project that saw full implementation in March 1998. The tolls range from 50¢ to \$4.00. Demand remains strong. As of September 1998, there were 5,000 transponders issued and 600 people on a waiting list. Proponents acknowledge the impact on equity, but insist that no one is worse off as a result (Dowall 2000).

Shadow Tolling: Shadow tolls are employed within various PPP structures where government pays private operators according to the number of vehicles using the road. The Fredricton-Moncton Highway in Canada employs shadow tolling. The biggest user is the UK. As of March 1997, the UK had entered into 8 shadow toll contracts with private consortia and was actively working to develop 7 more. As of 2002, 8 projects had been completed totalling nearly 600 km of roadway and costing 900 million euro (Vickerman 2002). Shadow tolls are seen as providing better value and enabling better management of whole life cycle costs. Shadow tolling is an effective option for rehabilitating existing roads. Initial estimates of the savings in the UK have been estimated at 15%-30% over 30 years.

Partial Tolling: The biggest risk with tolling is the chance that usage will be insufficient. In the mid-1990s, Hungary proceeded with several direct toll roads, but was less successful than anticipated. The 45 km M-1 and M-15 tollways linking Budapest, Vienna, and Bratislava saw only 55% of the projected traffic, attracting only 6,350 vehicles a day. Officials concluded that the roadway was too short and the time savings were marginal. The roadways could only attract 50% of expected toll revenues. A longer concession was granted, and the government now provides a subsidy. However, the subsidy is considerably smaller than if the project were not tolled. The M-5 is a 157 km tollway with 17 interchanges and 10 rest areas, currently attracting 7,650 vehicles a day. This represents 97% of the estimated traffic, and is yielding the private operators 96% of the anticipated toll revenue. The government subsidy, which was planned for in advance, is much lower than expected.

Cordon Tolling: Singapore was the first jurisdiction to employ the concept of cordon tolling—setting a toll barrier around a central business district to reduce congestion. The cordon toll was established in 1975, and resulted in a drop in congestion of 38%. In 1997, Singapore switched to a full electronic toll collection system (ETC). The toll is currently in effect from 7:30 AM to 6:30 PM Monday to Friday, and from 7:30 AM to 3:00 PM on Saturday. In February 2003, the City of London instituted the largest and most extensive road pricing project in the world. The central business district of the City was cordoned, and a sizeable toll levied equivalent to \$12 (CAD). Cordon tolling is also used in Norway and Sweden. Trondheim, the 3rd largest city in Norway (population of 140,000) established a toll ring around the downtown in 1991. Rates fluctuate from 62¢ to \$1.56. Inbound traffic was reduced by 10% and bus travel increased by 7%.

Vehicle-Miles-Traveled and Satellite Tolling: VMT tolling uses complex GPS systems and satellites to track and meter vehicles based on how much they drive. VMT tolling holds the potential to charge a direct user fee, based on marginal cost pricing, to every driver using a public road. A test project has been conducted in Oregon using both odometers and GPS-based systems. VMT is currently being considered in Europe, as well as California. It is widely expected that technology will allow fully operational VMT tolling by 2010.

growing in popularity, and has been applied in Melbourne, London, Singapore, Stockholm, and three cities in Norway. Cordon tolling entails little cost to apply and is relatively easy to administer. Properly applied, it has not resulted in a drop in land values within central districts or the relocation of business. Successful cordon tolling is always accompanied with other measures to provide alternatives to driving. In Singapore, bus service was expanded and parking facilities at the edge of the central business district were constructed.

Some have suggested that the idea of cordon tolling be extended to encompass entire cities. To solve issues with fiscal disequivalence arising from outside traffic, cities could cordon themselves by levying a toll on major urban expressways and arterial roads leading into the city (Kitchen 2003). Such cordon tolling allows outside traffic to help fund the infrastructure they are using.

Vehicle-Miles-Travelled Fees: The latest innovation in road pricing is the vehicle-miles-traveled (VMT) option. VMT is often described as a tax, but it is better described as a fee. The idea behind VMT is to charge drivers according to the type of vehicle they drive and the total distance that they drive. The assumption is that these two measures are a much better pricing mechanism for the funding of roadway infrastructure than sources like the fuel tax, which charges drivers only according to the amount of fuel purchased. VMT has usually been seen as the alternative to road tolling, and a way to ensure more stable funding given the increased fuel efficiency of newer vehicles and the introduction of alternative fuels.

The problem, however, is that VMT fees are expensive to administer and are surrounded with a number of practical difficulties. Not only does a VMT fee system require regular odometer readings, but the method of collection remains an ongoing concern. Some have suggested that odometer readings could be downloaded at the gas pump and subsequently billed when fuel is purchased. While other options have been advanced as well, all of them invariably involve high transaction costs that renders the VMT impractical—nothing more than wishful thinking.

However, ongoing developments in remote sensing technology and satellite GPS systems are changing all of that, and the VMT approach is beginning to draw significantly more attention. Innovations such as smart odometers and satellite

GPS units have the potential to track the miles being travelled by each and every vehicle, no matter where that vehicle is located. In short, it may soon be possible to install a fully functioning and reliable meter in every vehicle.

The potential impact of this technology represents a sea change in transportation financing and funding. For the first time, marginal cost pricing can be applied on all roadway-related infrastructure. VMT-based satellite tolling will allow each and every individual driver to be directly charged based on what they drive, where they drive, how often they drive, and how much they drive. The implications from a pricing perspective are astounding, not to mention the ripple effects on other modes such as urban public transit. The technology can be applied anywhere in the world and to all types of roadways—both urban and rural. Revenues collected can also be distributed among different governing jurisdictions based on the usage of their roadway infrastructure. The technology is being developed and it is expected to be widely available within the next decade.

VMT satellite tolling is already drawing significant interest across Europe, and in certain corners of the US. It has already been suggested in the Netherlands that the current patchwork of fuel taxes, motor vehicle registration fees, and taxes on insurance should be eliminated, and the lost revenue replaced with a direct VMT user fee on driving. All of this should be more than a little sobering for governments, the policy community, and the average Canadian. While we cannot even properly meter and charge for water consumption, other countries are going ahead with plans to meter their cars. In many respects, Canada may have a lot of catching up to do.

SUMMARY OF USER FEES

The selection and application of various funding mechanisms for municipal infrastructure carries huge implications due to the array of economic and financial incentives that come with the different choices. This is no small matter. Funding infrastructure out of general tax revenue can produce significant distortions as it divorces those who use infrastructure and those who ultimately pay for it. Across the municipal sector, this has led to artificially increased demand for infrastructure, the over-consumption of municipal services, higher total costs, and waste. In the municipal context, all of this is aggravated by a heavy dependence on the property tax and the way it is currently administered.

In response, direct user pay should always be the first choice, with a particular focus on full cost recovery of all operating and capital costs, as well as marginal cost pricing. Partial cost recovery and average cost pricing is the second best option. If user pay is not practical at all, user pay taxation should be the third choice. General taxation should generally be reserved as the funding choice of last resort. In making the choice of a funding tool, cities must allow the different characteristics of infrastructure to play a significant role in guiding the final selection.

Innovation reaches its peak when cities begin converting traditional tax-funded infrastructure to user pay. While many forms of infrastructure have not lent themselves to this approach in the past, new advances in technology are providing the opportunity to start accurately pricing these systems. Roadway infrastructure is an excellent example. Electronic toll collection (ETC) and intelligent transportation systems (ITS) are lowering the transaction costs of the toll road, and new advancements in GPS systems and the advent of satellite tolling could allow for the wide-scale adoption of VMT pricing. With VMT, each and every vehicle can be directly tolled regardless of the road on which it is travelling. The implications and potential of such technology are staggering.

3. Delivery Tools

3.1. Public

The underlying problem in the provision of much infrastructure is the combination of two reasonable concerns: customers fear that private firms will use their market power to overcharge, and private firms fear that governments will use their regulatory power to prevent them from covering their costs. Private firms originally created much of the world's infrastructure, but the playing out of these fears, combined with prevailing skepticism about markets and private ownership, led to widespread nationalization of infrastructure after World War II. Under public provision, however, the problems re-emerged in different guises and were joined by others. Infrastructure services remained highly politicized, and government frequently kept prices below costs. The low prices were sometimes presented as necessary to help the poor, but the beneficiaries tended to be those who had access to services, so the poorest members of the community usually missed out...

—OECD Secretariat (2005)

There are a number of reasons for this dominant public sector role in infrastructure development: recognition of its economic and political importance; a belief that problems with technology required a highly activist response by governments; and expectation that governments could perform where private markets could not. Yet, after years of progress in infrastructure expansion under public leadership, recent experiences have often revealed a chronic misallocation of resources and a repeated failure to respond to demand. Public leadership involving ownership, financing, and/or operation has seldom demonstrated any advantage over private sector involvement in poverty reduction or environmental protection.

—United Nations Secretariat (1995)

When it comes to the delivery of infrastructure and innovative infrastructure finance, the quotes above are not an anomaly in the literature, nor are such sentiments evident only within certain ideological camps. In many ways and for many reasons, the perceived capacity of the public sector to effectively and efficiently provide infrastructure has fallen on hard times. Some of this criticism is no doubt justified, while in other instances it is not. It is well beyond the scope of this effort to offer a full blown theory behind the public role in infrastructure provision, or to gauge its success. As such, our considerations will be brief.

Advantages

The classic argument for a strong public role in infrastructure provision rests on the nature of infrastructure in general. Infrastructure possesses a strong public good component, significant positive externalities, inelastic demand, and large economies of scale. Infrastructure is an example of market failure and a natural monopoly. If a strong public role is not assumed, the infrastructure will simply not be provided, or not enough of it will be provided. In other words, there is often no alternative to public sector involvement, whether that be direct public provision or strong regulatory oversight of private provision.

When constructing new infrastructure, a strong public role is often necessary because the up-front costs are large, and they can also go uncompensated for some time. Often, the bulk of the financial capital has to be invested before any return is gained through charges imposed on users. Because infrastructure often builds in advance capacity, new infrastructure is also unlikely to be operated at full capacity

during the short-term. This reduces the revenue relative to the size of the investment. Under these conditions, private delivery becomes difficult (Allen Consulting Group 2003).

At the same time, the public sector has become involved in delivering infrastructure and services that could be provided privately. For example, electricity and water infrastructure is privately provided with public oversight in many jurisdictions. Here, public delivery has often been seen as the best way to advance certain municipal, provincial, and national economic goals or to coordinate various infrastructure systems that stretch from one end of the country to the other. In some instances, public regulation of private providers has been viewed as less effective than outright public provision. Oftentimes, the deciding factor between public and private provision is emotionally or ideologically driven. In the end, there are many reasons for a strong public role in infrastructure, even if it could be provided privately.

Disadvantages

Public sector provision of infrastructure is typically criticized on several fronts. From an economic perspective, it is hampered by a lack of competition and financial incentives that drive efficiency. Governments often do not gauge the real demand or market for services, and they have little incentive to improve efficiency. Often, investment planning has been supply driven rather than demand driven, and planning is sometimes based on faulty estimates of future requirements (Dowall 2000). From a management perspective, government is seen to work around a short-term time horizon. In government, there is little to no credit given for long-term success, but infrastructure is very long-term (Kee and Forrer 2002). From an organizational perspective, the public civil service is driven by process and procedure as opposed to measurable outcomes. From a political vantage point, governments are always under pressure to keep infrastructure prices—taxes—down. This has resulted in the under-pricing of infrastructure, and in some places, notoriously under-maintained systems. Fiscally, infrastructure must go up against other budget priorities such as health care and education, against which it does not tend to compete well. As a result, some conclude that the current government-centric model has become increasingly dysfunctional with respect to infrastructure, and it will become less relevant as the 21st century progresses (Shane 2005).

Winning Conditions and Applications

Despite opinions to the contrary, the public sector will never be all things to all people. No matter the amount of individual and collective wealth a society attains, the scarcity of resources continues. When considering infrastructure financing, funding, and provision, the public sector must ask a simple yet fundamental question: how can government facilitate the best infrastructure and public services to the greatest number of its citizens, and do so in a way that is environmentally sustainable, economically efficient, fiscally prudent, and socially just? The answer is not at all clear. But certainly, it must encompass more than the rhetorical reply of public delivery at all costs.

A close examination and analysis of all municipal infrastructure and services would be a good start. The City of Winnipeg engaged in such a process, and reviewed 195 separate infrastructure and municipal services to identify the best candidates for public delivery, and the best ones for private delivery with public regulation (Vander Ploeg 2002a). The City of Indianapolis—the 12th largest city in the US—conducted a wholesale review of all of its municipal services and infrastructure, and eventually put to competitive tender 85 infrastructure systems and services. The initiative resulted in a 25% savings across the entire municipal budget and a 400% increase in reserves. As of 2001, the City estimated a combined savings of \$450 million over 10 years. The savings were leveraged with other financing sources to support an infrastructure renewal program totalling \$1.3 billion. Since 1992, the City of Indianapolis has played host to over 4,000 civic leaders from around the world who have come to explore this fascinating reform initiative (Vander Ploeg 2004a). The program has received almost universal accolades from business, labour, analysts, and the public at large (Acumen Consulting 1999).

Local governments are monopoly providers of numerous infrastructure and services. The most popular rationale offered for this approach is that public provision is required to take advantage of economies of scale. However, economies of scale vary according to the infrastructure or service in view, and the deliberate creation of diseconomies of scale can frequently more than offset any initial savings that results from monopoly provision (Schmidt 2000). One study suggests that up to 80% of all municipal services may not possess economies of scale (Bish 2001). Delivering services

with diseconomies of scale over a large urban area through a public monopoly makes little economic sense—even if a large city can accomplish it. Cities need to continually be asking themselves: Does this infrastructure or service demand public provision? If so, why?

3.1.1. Traditional Public

The traditional mode of infrastructure provision in the municipal context is marked by several distinct features. Typically, provision is accomplished through a specific department within the governing organization. Examples include transit departments, parks and recreation, or community and family services. Separate decentralized agencies at arm's length from the larger operation can also become involved, especially for specialized infrastructure. A classic example are municipal police commissions. Under public provision, the infrastructure is funded with public sources—either taxation, user fees, or some combination. The infrastructure is publicly owned and operated by public employees.

In the traditional model of public delivery, the role of the private sector is constrained, but not irrelevant. Private investment capital has always played a key role in the debt-financing of publicly provided infrastructure, and the private sector is also regularly contracted to design specific infrastructure. Under the traditional model of public provision, further private participation is generally limited to private firms involved in a competitive tendering process for the construction or rehabilitation of specific infrastructure components, often termed bid-build.

3.1.2. Innovative Public

A. CREATION OF NEW MUNICIPAL UTILITIES

Virtually every municipality operates a set of utilities separate from general operations. Examples include distinct water and wastewater utilities. Under a utility model, user fees and other revenue associated with a particular infrastructure and municipal service are collected and dedicated to this service alone, and are recorded separately from general revenue. Through separate accounting systems, all revenue and operating and capital expenditures are independently tracked and monitored. Utility infrastructure and services

are also managed autonomously from all other municipal services.

One innovation in the public provision of municipal infrastructure has been to convert various departments into self-contained municipal utilities within the governing operation. This idea often runs in tandem with converting tax-based infrastructure to user pay systems. For example, if storm water drainage is converted to user pay, a new utility can be created.

Advantages

From a financing and funding perspective, separate utility operations facilitate the development of activity-based accounting. Activity-based accounting, or full cost accounting, allows public decision-makers to get a better handle on the costs of different infrastructure and municipal services, and the revenues that they generate. This information allows for better financial planning and review, as well as better capital asset management. If user fee revenues are insufficient to fund the combined operating, maintenance, and capital expenditures, the level of subsidy provided will also be more visible. Separate utility operations also allow for the development of more specialized expertise within the municipal operation.

Disadvantages

A separate utility model cannot be created for each individual infrastructure system or municipal service. Increasing the number of utilities may also result in increased costs of administration, as overhead costs are duplicated across various service functions.

Winning Conditions and Applications

Any infrastructure and municipal service either partially or completely funded through user fees can theoretically benefit from delivery through a municipal utility, allowing operating and capital costs to be better tracked. However, the user fee revenue should constitute a significant source of funding for the utility model to provide long-term benefits. In Canada, cities have established separate utilities for water supply, treatment, and distribution; wastewater collection and treatment; solid waste services; storm water drainage; electrical distribution; transit; municipal fleet operations; real estate and housing services; and parks and recreation.

B. CORPORATIZATION AND PUBLIC INTEREST COMPANIES

A further step up the innovation ladder occurs when self-financing municipal utilities are corporatized into a public enterprise company. This delivery method rearranges public infrastructure and service provision through the formation of a limited stock company. Such corporations are owned by the local government, but operate under their own separate board of directors and managers. The approach is relatively rare in Canada. However, the cities of Edmonton and Calgary followed such an approach with their municipal electricity utilities in the late 1990s. Provincial deregulation of the electrical industry convinced the cities to create their own electrical distribution companies, ENMAX in Calgary and EPCOR in Edmonton.

Advantages

The main idea behind corporatization is to inject some private sector corporate governance and incentives into the operation, while retaining the benefits of public ownership. The independence provided through a public enterprise company also allows for the development of highly focused service delivery goals and increased accountability. The legal transformation allows the board to change management where it is needed, and also tie compensation and contracts to clear performance goals. The drive is to eliminate traditional public sector constraints and focus attention more closely on the need to achieve fiscal self-sufficiency (Dowall 2001).

Disadvantages

Corporatization is often seen as the first step toward the full scale privatization of a municipal function. Often, opposition to the move is based on this fear alone. Corporatization makes privatization easier to accomplish, since the financial aspects of the operation can be easily measured. However, corporatization need not result in privatization. The City of Calgary engaged in a vigorous debate over this very possibility a few years ago. The decision was made to keep ENMAX as a wholly owned municipal corporation.

Winning Conditions and Applications

Local governments have not had a lot of experience with corporatization, and the literature on the subject is not very well developed. However, the process essentially mimics the creation of independent local airport authorities, which

from an infrastructure financing perspective, has been very successful in Canada. The history and development of EPCOR certainly provides an interesting case study. The corporation is a significant provider of infrastructure and services to most communities in the greater Edmonton area, as well as communities across the province of Alberta. The corporation has expanded beyond electricity to include water provision as well. In 2005, the City of Edmonton debated whether to turn its new storm water drainage utility over to EPCOR, but decided against the move.

C. SPECIAL DISTRICT FINANCING

With special district financing, a local government establishes an independent governing authority with its own powers of taxation for the sole purpose of delivering a specific municipal service or infrastructure in a limited geographical area (Guerard 2005). The concept of special district financing is strictly a US phenomenon. Up to 47 states now allow for special district financing, in various forms and configurations. Special districts can be struck to finance and fund a package of infrastructure for new developments or the redevelopment of infrastructure in existing communities. They can be approved by municipalities or counties, but often require voter approval in a referendum.

Special districts do not constitute a new or innovative source of financing or funding revenue. Rather, they are an alternative governing structure. To finance infrastructure, special districts issue their own bonds and then repay them with either user fees or local improvement levies imposed across the district. Special districts have their own independent sources of revenue and operate within strict geographical boundaries. Special district financing grew out of Proposition 13 in California, which capped local government property taxes and forced local governments to search out alternative modes of providing infrastructure. Various other tax and expenditure limits in other states have prompted the same response.

Special districts come with a plethora of different labels. In California, special districts are typically called Community Facilities Districts (CFDs), Community Development Districts (CDDs), Community Development Authorities (CDAs) and Mello-Roos districts. In California alone, these districts have been responsible for providing an estimated \$20 billion worth of infrastructure since the early 1980s after

passage of Proposition 13. An estimated 90% of all planned developments in the state now use Mello-Roos districts to fund their infrastructure. In the rest of the country, special districts are called Community Improvement Districts (CIDs), Local Improvement Districts (LIDs), Special Improvement Districts (SIDs), Special Benefit Assessment Districts (SBAD) and Special Assessment Districts (SADs).

Special districts can take several forms. Single purpose districts are responsible for the provision of a single infrastructure service. Typical examples include sewer and water districts. Multi-purpose districts finance and fund a wide range of infrastructure. Enterprise districts operate very much like a commercial venture, and charge user fees to customers based on full cost recovery. Non-enterprise districts typically use a local improvement tax or property tax surcharge to provide non-marketable infrastructure and services. Such services include parks, policing, fire response, pest abatement, libraries, and cemeteries.

In Canada, the scope of special district financing is much more limited, being largely restricted to independent governing authorities like police commissions, library boards, and various utility commissions. These entities do not have independent taxing authority. Expansion of special districts in Canada has generally been restricted to the emergence in recent years of a number of regional transit authorities.

Advantages

The advantages of special district financing are largely a function of the revenue tools at their disposal. User fees and local improvement levies are an efficient method of funding infrastructure since they recoup the costs from those who directly benefit. In the US, the method has often been used by local communities that want to obtain better municipal services than what the larger municipality is able or willing to provide, and because they often require voter approval, special districts are often seen as being more responsive to community needs. Special district financing also allows infrastructure to be better maintained over the course of its useful life given the smaller focus of the district. The singular focus of many districts may also allow for less expensive provision compared to large multi-purpose governments (Schmidt 2000). Special districts tend to raise little political opposition, they are generally viewed as a good way to target specific infrastructure and services to specific groups, and they tend to be better insulated against local politics (Slack 1996).

Disadvantages

Special district financing runs the risk of government fragmentation and a weakening of political accountability (Slack 1996). While the risk should not be assumed, it does rise with each new district approved. Special district financing may also be redundant, performing basic functions that any integrated local government should be providing. Like any local improvement levy, less wealthy neighbourhoods are not likely to benefit from the approach, which raises certain equity issues. Excessive special district financing can also lead to problems with coordinating highly integrated infrastructure, and the approach has been criticized as being relatively inflexible.

Special district financing is only suitable for highly localized infrastructure serving a relatively small geographic area. The model does not speak to the larger infrastructure concerns running across communities or large city-regions. A lack of independent revenue sources, low accountability to voters, and poorly drawn boundaries have made the special districts, on average, no more efficient as infrastructure providers than multi-purpose municipal governments (Congressional Budget Office 1988).

Winning Conditions and Applications

To the extent that Canadian local governments can employ user fees and local improvement levies by working within their current governing structure, special district financing is probably best avoided. In the end, special districts may complicate governance rather than improve it. It is important to understand that the US experience is a direct response to certain barriers that have been erected at the local government level, particularly legislated caps on property taxes. In the Canadian context, there may simply be no compelling reason for these entities.

With that said, special district financing is best suited for hard economic infrastructure that will benefit specific groups of property owners and avoid imposing costs on the wider community. While special district financing is often used to provide a singular infrastructure system or service, it is also useful when a variety of different improvements are needed within a well-defined area. Examples include local roads, streetlighting, sidewalks, and water and wastewater infrastructure. Complaints against special district financing tend to grow as the number of districts proliferate, particularly

when levies start getting charged for programs like job training and placement, which are unrelated to the fundamental purposes behind the local improvement levy.

SUMMARY OF PUBLIC DELIVERY

The nature and economics of infrastructure will always ensure a continuing and vital role for government in its provision. However, the most appropriate form of that role is less clear. In some instances, direct public provision makes sense. In other instances, governments should consider doing less rowing and more steering. In the end, direct public delivery of infrastructure and other municipal services should not always be assumed, and a decision in its favour should not be singularly driven or defended by emotional or ideological considerations. Rather, effectiveness, efficiency, and equity concerns, are more important. Delivery through a utility model or a public corporate model are two recent innovations that may offer a better way forward.

3.2. Private

Overall, 46% of all water service systems in the United States are now privately owned. Results of several studies suggest that the decision to have public entities provide water should be reconsidered since private organizations can provide this function at the same cost without subsidies or tax exemptions. In fact, the real water bill is higher for government owned water companies than for private entities because publicly-owned water companies receive a substantial amount of their income from excess cash balances and investments. Additionally, government can better regulate a privately owned water company than a government owned water provider.

—Robert Schmidt (Schmidt 2000)

It is strangely little known that water projects have been developed privately in many countries around the world, including Canada. Drinking water supplies and sewage treatment are obvious candidates for privatization because of their relatively easily defined costs and the existence of billing mechanisms to charge for them. But where costs and benefits are not so easily defined and assigned—as may be the case with road improvements where there are public good characteristics—partnership approaches will be more appealing.

—Finn Poschmann (Poschmann 2003)

Edmonton's EPCOR: The Corporatization Alternative

EPCOR is a multi-service utility corporation wholly owned by the City of Edmonton. EPCOR was created in 1996 when Edmonton decided to convert its electrical utility into a municipal corporation. A year later, the City also spun off its water utility to EPCOR.

The primary motivation behind the creation of EPCOR was that the City owned significantly more electrical generation assets than it required. The City also believed a separate corporation would be better positioned in a new deregulated electricity market, but did not want to privatize the utility. In 1995, the City privatized Edmonton Telephones (Ed Tel), but decided this was not the best option for its electrical utility.

The creation of EPCOR has had no small impact upon Edmonton's operating revenues. Over the last 10 years, the corporation has paid significant dividends to the City. For example, the operating surpluses of the former electrical and water utilities averaged about \$253.9 million annually from 1990–1995. From 1996–2000, however, the annual operating surplus of EPCOR has averaged \$476.6 million, out of which dividends to the City were paid. Because almost 70% of EPCOR's electrical and water revenues are earned outside of Edmonton, the dividend revenue is largely a source of external revenue.

EPCOR has also become involved in various public-private partnership activities. Although the corporation is publicly owned, it often acts as the private partner in various PPP arrangements. For example, EPCOR has won several operations and maintenance contracts (O&M) offered by other communities that have retained the ownership of their water utility, but have decided to contract out operations and management. EPCOR was also the private partner in the development of the water treatment facility in Port Hardy, British Columbia. That project was essentially a design-build-operate, or DBO, PPP arrangement.

The private delivery of public-use infrastructure is neither new nor unusual. Prior to WW II, railways, power plants, ports, harbours, water systems, and many local roads and bridges were privately constructed, owned and operated. Examples of large infrastructure assets delivered privately include the Suez Canal and the Trans-Siberian Railway (International Project Finance Corporation 2005). In fact, Canada's first major investment in transportation infrastructure—the

Canadian Pacific Railway—was publicly facilitated but privately constructed, owned and operated. Significant infrastructure assets were nationalized both during and after WW II, primarily as a tool of government economic policy. Fifty years later, the focus is returning to privately delivered infrastructure as high levels of public debt and competing priorities mean that needed projects are not going ahead (International Project Finance Corporation 2005).

Advantages

Private provision of public-use infrastructure is often defended as being more efficient and better managed. Private provision also frees up public resources that can be used for other purposes. Private provision can also allow for a stronger emphasis on rational pricing of infrastructure because it is more difficult for governments to directly subsidize a private provider with tax dollars. Private provision is also defended for its ability to integrate better technology.

However, many of these advantages are highly dependent on how the market is structured, the degree to which the private provider is regulated, and how that regulation is carried out. Efficiency and other traditional private sector incentives are only maximized within a competitive market, but this does not always exist. To ensure adequate levels of service provision, universal access, and reasonable user fee charges, governments will often regulate a private provider. From an economic perspective, heavily regulated private providers have little incentive to behave differently than government providers, even though they are at arm's length and enjoy a separate legal status. At the same time, many analysts also contend that private providers of infrastructure are easier to regulate than government providers.

Disadvantages

Government regulating bodies can sometimes be “captured” by the private provider. While this happens for a number of reasons, it invariably works against the public interest and leads to inadequate outcomes. Because the ownership of the infrastructure is in private hands, governments also have a harder time using it to advance other important policy objectives. For example, much of the Canadian telecommunications industry was first held in public hands given the significance of the technology to overall economic development. Only when the infrastructure was widely available was it divested to the private sector.

Winning Conditions and Applications

The essential condition for private delivery is the marketability of the infrastructure. For private provision to be successful, there must be a way to identify individual users and directly charge them for accessing the infrastructure. If an infrastructure cannot be priced, it will usually be publicly provided. Much of Canada's telecommunications and energy infrastructure (e.g., electrical generation, distribution and natural gas) are privately provided. Non-public delivery also occurs in transportation, including both railways and airports.

3.2.1. Traditional Private

Traditional private provision of infrastructure occurs through large investor-owned stock companies that are publicly traded. These companies design, finance, build, own, and operate their own infrastructure, and charge individual users a fee. The companies arrange for their own private investment capital and all workers are privately employed. But even with private provision, governments do play a vital role.

First, private infrastructure provision often needs regulation to ensure that a monopoly position is not exploited and universal access is provided at a reasonable price. This was the standard model employed up to the 1980s. Since then, governments have followed a second approach—deregulating private infrastructure provision and facilitating competitive market conditions. This was often accomplished by unbundling large private utility operations and opening them to competition. Examples of deregulation in Canada include airlines, telecommunications, and electricity. Third, governments may also get involved through direct financial subsidies, loan guarantees, and other methods. This generally occurs with infrastructure that is very large and less marketable. Such actions have a long history. In Canada, the CPR received title to thousands of acres of land on either side of the main line as partial compensation for the risks of constructing the railway. At the beginning of the 20th century, almost 10% of the US land mass was actually owned by private railroads (Cohen 2002). In the end, the winning conditions for private delivery are highly dependent upon the public's acceptance and comfort level, and whether or not government believes direct ownership of the infrastructure is needed to lever other policy goals. Related to this is whether the technology behind the infrastructure is at a formative stage, or whether it is well established.

3.2.2. Innovative Private

A. PRIVATIZATION OR FULL DIVESTITURE

A relatively familiar innovation in infrastructure delivery is the sale or divestiture of publicly owned infrastructure assets to private interests. Throughout the 1980s, privatizations occurred in the US, the UK, France, and Mexico. Both the UK and New Zealand pursued particularly aggressive privatization programs. Between 1987 and 1991, the UK sold public assets worth almost 15% of GDP (Dowall 2000).

Privatization is not unknown in Canada either. Previous national privatizations include Air Canada, Petro Canada, and CN Rail. Provincial privatizations have included Alberta Government Telephones in 1990, and Manitoba Government Telephones in 1996. Privatizations in the municipal sector have included the sale of Edmonton Telephones (Ed Tel) in 1996 and Winnipeg Hydro in 2002.

Advantages

A primary advantage, and the main rationale behind privatization, is the goal of lower costs and higher revenues through increased efficiency. Efficiency gains under private ownership result from better operating practices and increased employee productivity through the application of new technologies, specialized expertise, better use of capital equipment, and private sector innovation. Volume purchasing and better management of asset life-cycle costs also contribute.

Many public infrastructure assets and services, when converted to private ownership, are also expanded. Better marketing and the development of new service options leads to more customers, higher sales, increased revenue, and wider margins. The successful privatization is measured by better value for money, better services, increased net revenue, and no increase in price for the end user. Through that ambitious goal, the idea is to redirect the savings generated to increased investment in the underlying infrastructure. Privatization also allows for the transfer of risk and it creates a new source of income and property tax revenue for government. Privatization is intended to increase the value of publicly owned assets by placing them in someone else's hands (Joyner, Steckler, and Wolf 2003).

From an infrastructure financing perspective, an important benefit of privatization is how it can unleash the financial capital locked up in various assets. Whenever an asset is sold, the sale produces a one-time revenue windfall. Depending on the amount of equity in the asset, that windfall can be substantial. When Ed Tel was privatized in 1996, the sale yielded \$470 million for the City of Edmonton and represented a \$292 million gain on the City's shares. The City of Edmonton decided to create an endowment with the proceeds—the Ed Tel Endowment Fund. The fund has a current market value of \$677.7 million. From 1990-1995, Ed Tel generated an average of \$31.3 million annually for the City. From 1996-2000, the endowment generated an annual average of \$60.3 million in interest income. Privatization produces new revenue that can be expended on other infrastructure priorities, or invested to create a new ongoing source of revenue.

One of the biggest advantages of privatization is the infrastructure that it targets. Privatization involves the shedding off of an existing infrastructure asset and service that may need substantial re-investment at the same time as it generates new revenue that can be re-invested in other existing assets that are retained. As noted earlier, re-investing in existing infrastructure is typically more difficult than building new infrastructure. Privatization focuses directly on existing infrastructure systems.

Disadvantages

One of the most significant disadvantages with privatization is public perception. For many, privatization is the result of an ideological commitment to reduce the size of the public sector, resulting in layoffs, lower wages, the use of non-unionized employees, loss of the public interest, and lower levels of service. Although all of that can certainly occur, it usually happens with privatizations that were carried out for the wrong reasons, or that were poorly prepared and rolled out. For the most part, these perceptions are overstated. For example, many privatizations carry conditions that prohibit layoffs and also require the new owners to accept the union, honour the collective agreement, and maintain salaries and wages. Staffing levels are typically reduced only through attrition and buy-outs.

Privatization bumps up against a certain psychology within the collective public mind. When confronted with a possible privatization, the public often equates the situation to personal

conditions. For example, when an individual sells an asset like the family car, they give up the right to use it. With privatization, the ownership of the asset changes but it is still available for public use. Across the public, this is not widely understood (Joyner, Steckler, and Wolf 2003).

Privatization remains a controversial issue and often stirs up strong public reaction. This is particularly the case when certain infrastructure assets are involved. It is one thing to privatize a national oil and gas company or a provincial telephone utility, and quite another thing altogether to sell off the local water system, especially if a foreign owned company is the purchaser. Because many Canadian cities have already divested themselves of the easier privatization candidates, this innovation may have less potential today than in years past.

However, the envelope could still be pushed. Water infrastructure is privately provided across the US and France, and water was part of a much larger privatization program in the UK during the 1980s. The effort resulted in substantial investment in water and wastewater infrastructure, improved water quality, and better environmental protection, but prices also rose 20%. Most believe that price increase would have been even higher if the new infrastructure investments were delivered publicly. A World Bank study confirmed that water privatization in the UK had successfully delivered the necessary infrastructure investments and improved water quality, but the regulatory framework for the first few years could have been improved upon (Dowall 2000).

Winning Conditions and Applications

Privatization is a highly detailed, complex, and risky venture. The stakes are high and mistakes are expensive. Before privatization, feasibility studies must be conducted and independent legal, financial, and technical expertise used to build the business case, design the process, market the opportunity, build the criteria to assess proposals, ensure due diligence, negotiate the deal, and assist with the transition.

Successful privatizations include claw-back provisions for windfall profits, reliable cost information, strategies for building public and political support, and workforce transition programs. Issues of regulation need to be addressed, procedures for monitoring and oversight put in place, and service standards arrived upon. Intergovernmental approval and cooperation may also be needed. A strong public case

must be built and stakeholders consulted and brought on board. This includes the union leadership, union membership, and public managers, all of whom are highly suspicious of privatization. Successful privatization requires the new owners to accommodate the union, accept the existing contract, and commit to a no lay-off policy. For good reason, privatization needs a political champion. For most, the risks are simply too high—both politically and fiscally.

Governments must be realistic about the selling price. Selling prices that are too high end up in a failed deal or rate increases for consumers. Private bidders have a maximum offer centering around the revenue they believe the asset can generate and the costs they expect to incur. This does not always relate to book value or even market value. It is a strict cash flow calculation. Bidders have to factor in higher borrowing costs in the private sector, taxation, and the return on investment. In the end, the goal should be a fair and reasonable price that will allow user rates to be lowered while infrastructure and service improves (Joyner, Steckler, and Wolf 2003).

While almost any utility asset can be privatized, those with modest amounts of debt—typically less than 40% of the value of the rate base—make the best candidates. Potential assets must also be funded through user pay. In the municipal context, this narrows the field considerably, restricting the process to municipal utilities such as water, wastewater, solid waste, electricity, and toll roads that are self-funding through direct user charges. Accurate revenue, operating expenditure, and capital expenditure data are required, and the service outcomes must be measurable, especially if public oversight is to be conducted through subsequent regulation. Corporatizing the asset prior to privatization allows the infrastructure and corresponding service to better meet some of these conditions.

B. SALE-LEASEBACK ARRANGEMENTS

Privatization is best suited for infrastructure where public ownership is less important, and simply ensuring the infrastructure is provided in sufficient quantity and quality is most important (Joyner, Steckler, and Wolf 2003). Because the general public does not always understand this distinction, the idea of the sale-leaseback has emerged as a practical alternative to privatization. Sale-leasebacks are less dramatic—a kinder and gentler privatization.

Under a sale-leaseback arrangement, the public sector retains legal ownership of the infrastructure, but relinquishes practical control and certain rights of ownership—including the right to collect user fees—to a private lessee under a lease contract. Like privatization, sale-leasebacks result in a substantial up-front payment. To calculate the amount, the private lessee estimates how much can be saved over the life of the lease contract through a more efficient operation. The anticipated savings are then capitalized into a one-time up-front payment to the public owner of the asset. The size of this payment is usually net of the anticipated costs of reinvesting in the infrastructure. Instead of an up-front payment, sale-leasebacks can also be negotiated to provide for regular rental payments, or some combination of the two (Joyner, Steckler, and Wolf 2003).

In a sale-leaseback, the sale is the up-front payment giving the private lessee the rights to collect revenue from the asset. This right extends only over a pre-determined period of time—the lease. Because the revenue rights to the asset are temporary, the sale-leaseback option allows the public sector to take the asset back at some later point.

Advantages

The typical goal of a sale-leaseback is to secure a better financing and funding environment for capital improvements to a specific infrastructure by involving the private sector. But in doing that, government can also lever improvements to other infrastructure as well. Under a sale-leaseback, the government loses its ability to collect revenue off the asset, but that is more than offset by the shedding of financial responsibility for the asset and the one-time lump sum payment. The net revenue gain produced by a sale-leaseback can be used by government for other infrastructure improvements on a pay-as-you-go basis. Conversely, the lump sum payment can be invested to produce a stream of new revenue that can be used to fund the debt-financing of other infrastructure improvements. Regular lease payments can do the same. For example, regular lease payments of \$2 million a year could leverage \$28 million in debt-financing for infrastructure improvements elsewhere.

A significant advantage in all of this is that the government does not have to give up title to the asset. Further, the government can also exercise some control over the functioning of the asset through various performance

New Candidates: Privatization and Sale-Leaseback

Water and Wastewater: Privatization and sale-leaseback of this infrastructure is growing across the US. Privatization or sale-leaseback for water infrastructure can generate an up-front payment ranging from \$1,500 to \$3,500 for each customer connection—higher if service can be expanded or cost savings are exceptional. Sewer infrastructure can generate an up-front payment of \$1,000 per connection.

Roadways: Tolled roads and bridges are also good candidates. The up-front payment from privatization or a sale-leaseback is linked to traffic volume and the toll. Large toll roads can generate 10¢ to 30¢ per annual vehicle mile depending on condition, location, growth potential, and alternate routes. Bridges can generate 50¢ to \$2.00 per annual vehicle crossing. High occupancy vehicle or HOV lanes that can be converted to tolled HOT lanes, and congested roads that can be rehabilitated and converted into tollways are also candidates.

Streetlights: Streetlights appear to have little commercial value, but they can also generate an up-front privatization or sale-leaseback payment. Streetlights can be privatized or leased, and the lighting repurchased under a service contract, often at a cost no greater than what the city was spending before. In the deal, the city keeps the difference between the sale or sale-leaseback price—up to \$2,000 per light—and the lower costs of the private operator. This difference can be capitalized into an up-front payment—as much as \$300 per light net of what the city currently pays. Kansas City recently leased its streetlighting, and received a sale-leaseback payment of \$160 per light. Portland and Salt Lake City have contracted their streetlighting as well. Long Beach and Lakewood California both have a 25 year contract valued at more than \$80 million in which lights are being upgraded and expanded with no increase to the budget.

Transit: Transit systems, which are typically subsidized, are also being explored under various sale-leaseback arrangements. The primary mechanism here is a reverse-lease where the private lessee assumes responsibility for operations and maintenance, as well as long-term capital reinvestment. In return, the lessee receives payments from the city. Ideal candidates are systems built in the 1960s and 1970s that need major repair and replacement.

Source: Adapted from Joyner 2003.

Sale-Leaseback: The Chicago Skyway

The Chicago Skyway is a 7.8 mile (13 km) long toll bridge that opened to traffic in 1959, but has a troubled financial past. The Skyway was recently sold under a sale-leaseback arrangement to Cintra-Macquarie, a private consortium between Cintra, a Spanish toll road management corporation, and Macquarie, an Australian investment bank. The sale-leaseback is for 99 years, and resulted in a \$1.8 billion up-front payment to the City of Chicago.

The \$1.8 billion winning bid was considerably more than the \$800 million the City expected, showing just how much some public sector infrastructure providers undervalue their own assets. While the public sector looks at book value or some notional estimate of market value, the private sector looks at the revenue stream and the potential to grow the importance of the asset and attract new customers.

The 99 year long Skyway deal is similar to the one struck in 1999 for Highway 407 in Toronto. While Highway 407 is often described as privatization, it is a sale-leaseback with a very long concession. The Ontario government had similarly low-balled the value of Highway 407. The road cost \$1.2 billion (CDN) to construct, but produced a \$3.1 billion (CDN) up-front payment. However, critics still argue that it was sold too cheaply.

The Skyway is the first sale-leaseback of an existing toll road in the US. The City expects to use the funds to pay off the existing Skyway debt, repay other debt, and create a long-term reserve fund.

Cintra and Macquarie have experience in operating and maintaining more than 30 toll roads stretching over 1,000 miles, including Highway 407. Under the terms of the lease, the new operator must comply with detailed operating standards to assure safety, and capital maintenance must meet some rather high engineering standards. The agreement also limits future tolls for passenger cars to no more than \$2.50 until 2008, \$3.00 until 2011, \$3.50 until 2013, \$4.00 until 2015, \$4.50 until 2017, and \$5.00 starting in 2017. Later adjustments must be equal to the greater of 2% per year or the annual increase in inflation.

Source: Adapted from Samuel 2004.

guarantees built into the terms of the lease. This allows for much better monitoring than under a privatization scenario. Given these improvements over privatization, sale-leasebacks are much easier to accomplish politically, but yield much the same financial benefits.

Disadvantages

Sale-leaseback transactions can be very complicated. There are a myriad of different leasing options, and many of them cannot be quickly and easily explained. In many ways, an outright privatization can be easier to execute. The choice between the two options lies in the political realities surrounding privatization in general. Understandably, governments also try to secure the largest possible payment in a sale-leaseback. This tendency reduces the amount of savings that can be passed on to users, and it also restricts the private lessee's ability to reinvest in the infrastructure. Governments must not focus exclusively on the revenue end of the deal, but on the need to facilitate improvements in the infrastructure.

Sale-leasebacks are often confused with other type of leasing arrangements found under the broader rubric of public-private partnerships (PPPs). But the two are not the same. Unlike most PPP arrangements, the sale-leaseback results in a large up-front payment. Second, the contract terms or concession contracts of a sale-leaseback tend to very long-term. PPP-based leasing typically works with a concession or franchise period running from 15-20 years. Sale-leaseback arrangements are huge deals that have lease terms that can run anywhere from of 25 years and even out to 99 years. These longer concession periods are required for the private lessee to recoup the capital investments being made under the lease. For the government owner, sale-leasebacks entail giving up the rights of ownership for a significant period of time. Thus, sale-leasebacks are closer to the privatization concept than the public-private partnership concept.

Winning Conditions and Applications

Like privatization, the main focus of a sale-leaseback deal is existing infrastructure. Sale-leasebacks tend to work best when the private lessee is able to dramatically improve efficiency and service quality in both system operations and the implementation of a capital infrastructure improvement program through technology enhancements and stronger capital asset management practices, and better life-cycle

costing. Even with higher borrowing costs and the need to earn a return, facilities in need of major repair and expansion are excellent candidates because private operators can often be more efficient in their overall capital program. These savings usually outweigh the private sector's higher costs of borrowing and the need to turn a profit.

Sale-leasebacks are growing in importance because of the flexibility they offer. Leasing can take many different forms, and this increases their scope of application. Like privatization, sale-leasebacks typically involve infrastructure that is user pay, but deals can also be arranged for some forms of tax-funded infrastructure. For example, some US cities have sold all their streetlights to a private lessee, and then leased back the lighting under a service contract. The difference between the savings secured by the private operator and the current costs to the taxpayer of public operations is capitalized into a one-time payment to the city.

SUMMARY OF PRIVATE DELIVERY

The financing and funding of infrastructure is improved when an optimal balance is found between infrastructure that must be delivered publicly, and infrastructure that can be more efficiently and effectively delivered privately. In the past, privatization has been seen as the only means to reset the switch, but other options are now emerging. The concept of leasing is one alternative, particularly when it comes to existing infrastructure assets. The biggest gains, however, are likely achieved when the strengths of both sectors can be tapped and merged together. This takes us to the concept of the public-private partnership or PPP, to which we now turn.

3.3. Public-Private Partnerships (PPPs)

PPP is a concept which involves the public and private sectors working in co-operation and partnership to provide infrastructure and services. It is one of a range of alternative structures that fall between conventional procurement through state ownership at one end of the continuum, and full privatization at the other.

—International Financial Services London (2003)

The Australian government believes it should not fund infrastructure where a strong case exists for the private sector to do so, freeing its funds for still more works.

—Jim Lloyd, Minister for Local Government, Territories, and Roads (Lloyd 2005)

The concept of the public-private partnership (PPP or P-3) tends to dominate discussions of innovative infrastructure finance. While numerous definitions of PPP exist, most fail to capture the essence of the idea: a public-private partnership is any one of a number of arrangements between a government or public sector body and a private sector party that results in the private sector delivering infrastructure that is traditionally delivered by the public sector alone. In a public-private partnership, the public sector essentially purchases the costs of providing new infrastructure or the refurbishing of existing infrastructure, bundled with a flow of services, through a long-term financial commitment to a private vendor (Kee and Forrer 2002). Public-private partnerships are the method used as the middle-ground between pure public delivery on one hand, and complete private delivery on the other.

In North America, the concept is generally referred to as a public-private partnership. In the UK, PPP is synonymous with the Blair government's Private Finance Initiative or PFI. In Australia, PPPs are referred to as Privately Financed Projects or PFPs. In South Korea, the acronym PPII stands for Private Participation Infrastructure Initiatives. The labelling of different types of PPP arrangements also varies—from BOOTs and BOTs to BDs and BTOs.

Public-private partnerships incorporate three elements. First, the risks of bringing infrastructure and services to the public are shared between the public and private sector. Second, the financial rewards of the endeavour are shared. For the public sector, this comes in the form of reduced costs; for the private sector, it comes in the form of a return on investment. Third, the amount of reward expected is related to the amount of risk and responsibility taken on by the public and private sectors.

The public-private partnership is often confused with privatization, and for its opponents, PPP amounts to little more than privatization by stealth. But the two concepts are not the same. At the heart of the public-private partnership is a shift in thinking about the appropriate role of the public sector. Instead of being the exclusive financier, owner, operator, manager, and provider of public infrastructure, the public role is to facilitate, regulate, and guarantee provision. Depending on the infrastructure in view, government will leave the financing, ownership or operation to the private sector in a formalized partnership. In short, government should concern

itself not with how various infrastructure assets are delivered, but what quantity and quality should be delivered at what time. The role of the private sector is to decide how this is best accomplished based on what government has decided. In any PPP arrangement, the final responsibility for service delivery remains firmly within the public sector, which regulates and monitors private provision to ensure the right quantity and quality of infrastructure and services are being provided, and at a price that government has determined.

For proponents of PPP, the idea allows for more accountability and better protection of the public interest than privatization. The public sector is still intimately involved throughout the process, and all PPPs centre around a contractual obligation where the private provider must deliver what has been agreed upon, or suffer a penalty in the form of non-payment or even cancellation of the agreement. In most PPPs, the private partner is held to account through performance-based contracts that apply at various stages of the project. In most PPPs, ownership of the infrastructure remains with the public sector, but many of the financial risks of that ownership have been transferred to the private partners operating the infrastructure under contract.

While there is no standard formula, PPP projects usually start with a government decision to build a new infrastructure asset or rehabilitate an existing asset. Government planning decides when and where this activity will occur, and sets the specifications for both the quantity and the quality it desires. If the project is relatively small, the government will facilitate the partnership itself, identifying private partners to assist with the design, financing, construction, and operation of the infrastructure. Contracts are developed and signed, and work progresses. Government moves from its facilitation role, and becomes the regulator and monitor upon completion of the project.

Larger projects often reflect the private finance initiative process developed in the UK. Here, the public and private sectors create a new stand-alone business corporation—commonly called a special purpose vehicle or SPV. The sole purpose of the SPV is to carry out the business of the PPP by arranging the design, financing, construction, ownership, and operation of a new infrastructure asset. The SPV—which often includes representation from government, various private construction firms, legal and management companies, and

investment banks—is a separate legal entity, and arranges for the financing of the infrastructure. In some cases, the government is not a member of the SPV itself, but has contracted with a consortium of private interests who will form the new SPV corporation. In some PPP situations, the SPV role is contracted out to a specific firm that is intimately knowledgeable about the asset in question. For example, many toll road projects see governments partnering with a large international corporation that focuses exclusively on the construction and operation of toll roads.

The financing is typically securitized by the anticipated revenue the infrastructure will generate as well as the asset itself. Since there is little recourse to the assets of the various corporations or the governments involved, the financing of the infrastructure relies completely on the viability and strength of the project itself. For example, the financing of a new toll road is assessed based on the future toll revenues it will generate. As the process continues, the SPV enters into separate contracts with various firms for construction, as well as future operation. Depending on the nature of the asset, the SPV may own the asset in perpetuity, it might be purchased by government, or the asset might be owned and operated by the SPV for a certain period of time and then transferred to government.

As a concept, PPPs continue to evolve. The latest innovation is for governments to partner not with the private sector, but with the nonprofit sector by way of special purpose nonprofits or SPNPs. Such an arrangement was recently used to construct the new Southern Connector in South Carolina.

Public-private partnerships are often seen as a way for governments to raise more money for an infrastructure project. This is an over-simplification. PPPs are not about financing and funding alone—they are also about delivery. PPPs are about changing the political economy of providing infrastructure by combining the strengths of the public sector with strengths of the private sector. PPPs, moreover, are not just about infrastructure. While that is often the focus, the concept also addresses service delivery more broadly.

Advantages

Sharing of risk: The single largest advantage of a PPP is better allocation of the risks involved with financing, funding and delivering infrastructure. All of these activities include

a measure of uncertainty. Will the infrastructure perform as it should? Will enough user fee revenue materialize to service the debt or will the project default and require a tax subsidy? The risks can be huge, and they increase in proportion to the size of the infrastructure in question. In a PPP, the risks are shared between the public sector and the private sector partners, which lowers the level of uncertainty and results in less expensive financing costs. Sharing the risks of infrastructure development improves the chances for a successful project and lowers the total costs of service provision.

Flexibility: PPPs can be structured in a way to address almost any infrastructure or service, and can be employed by all orders of government. PPPs can entail a minimal amount of private involvement or a great deal of private involvement. PPPs can accord to the private partner a very high level of freedom to allow for maximum creativity, or the contracts can be very specific. No other financing, funding or delivery tool offers so much flexibility to design custom solutions and approaches.

Specialization: In a PPP, the public sector performs the activities that it does well and the private sector does the same. In this way, the experience and skills of the private sector are tapped to increase efficiency and lower costs.

On time: In a PPP, payments to the private partner are often conditioned upon completion of the infrastructure or the commencement of service. This acts as an incentive to complete the project on time or ahead of schedule.

New revenue streams: PPPs allow projects that might not have gone ahead without private participation to proceed. In addition, new user pay infrastructure may also yield a stream of public revenue and PPP projects that are owned and operated by the private sector can also result in an expanded tax base, thus generating additional revenue for governments.

Freeing up public funds: PPPs can free up public funds for government to use elsewhere, or preserve debt capacity for projects that do not lend themselves to private participation. However, much also depends on the PPP in question. Unlike PPP arrangements for marketable infrastructure that survive on their own user fee funding, some are for non-marketable infrastructure not funded through direct user charges. In

this case, governments may be making regular payments to the private partner for the infrastructure and services being rendered. These are often long-term arrangements that lock in a future operating expenditure for the government. In this case, funds are not freed up but locked up in an ongoing future expenditure.

Secure indirect subsidization: When a private sector actor partners with government, there is the possibility of the private partner passing on tax deductions that a government cannot claim itself.

More funding and better funding: Typically, the private sector can access a larger capital pool than can government. PPPs link players from different capital markets—both domestic and international—as well as equity investors. This opens the door to a whole range of new financing options that may offer better terms, longer amortizations, and smaller payments. Sophisticated capital markets are emerging to handle the rise in PPP deals now occurring world-wide. Many large infrastructure projects also require a substantial equity investment that governments may not be willing or able to provide.

Enhanced public management: When responsibility for design, financing, and operations is ceded to the private sector, this allows public sector managers to spend more time planning and monitoring services as opposed to micro-managing the full web of resources needed to provide the service. This allows managers and civil servants to spend more time on the real job of public management.

Competition: PPPs are put together in a competitive environment where private sector actors compete for the rights to partner with the government and design, construct, operate, and maybe even own an infrastructure asset. The competitive impulse is nothing more than a set of various financial incentives that force private actors to lower costs at the same time as they try to increase the quantity and quality of the services they offer. For the most part, governments do not operate in a competitive environment. PPPs are a way to bring the competitive impulse into the provision of public infrastructure and services. At the same time, PPPs are subject to the same labour laws and other government regulations that prevent destructive competition through low wages and other types of excess.

Innovation: The competitive impulse also drives innovation. To the extent that innovation can help lower costs, increase efficiency, and yield better outcomes, private partners will work hard to bring those new ideas to bear on a project.

Full cost pricing: Many governments fail to charge the right price to fully cover the costs of infrastructure. As a result, many public assets are in a state of decay and demand always exceeds supply. The PPP process forces governments to determine the real costs of providing infrastructure.

Value for money: Proponents of the PPP often defend the concept on the simple basis of lower total costs—both to the government and to the public. Opponents of PPP retort that there are myriad examples where lower costs were not achieved. Lower costs, however, are not the goal. Indeed, governments who look to PPPs as way to find some extra money and get the lowest cost possible will often be sorely disappointed—if not left holding a crashed PPP.

PPPs are about getting the best value for the money spent, and this does not necessarily equate to the lowest cost. Value for money encompasses a wide range of factors such as life-cycle asset management, improved design, optimal performance, better management, optimal transfer of risk, faster implementation, improved service quality, and more revenue.

In a PPP, the public sector invites the private sector to put some of its capital at risk and compete for the rights to deliver a public infrastructure asset. This sets off a number of synergies that may not result in lower costs, but can result in the best value for the dollar spent. This is the key strength of PPPs.

Much rests on how a PPP is structured. If done properly, value for money should result. The experience with PPPs around the world shows that most have produced efficiency gains and have expanded the stock of infrastructure, especially when there was meaningful competition in the process (Kitchen 2003). Such assessments are encouraging, but many other assessments disagree. As a result, the focus is better kept on individual PPP projects. Public-private partnerships are so varied that the approach does not lend itself to assessments that use a broad brush.

Disadvantages

High transaction costs: PPPs entail significant amounts of preparation, research, cost accounting, and negotiation. PPP projects must be continually monitored to ensure compliance with the specifications in the various construction and operations contracts, and service outputs must be carefully watched and quantity and quality measured. The bigger the project, the more effort it takes. All of these various activities are the transaction costs of carrying out a PPP. Transaction costs are to the economy what friction is to a physical system (Kee and Forrer 2002). Transaction costs slow things down and create costs and inefficiencies. Thus, PPPs may lower the burden on some public managers, but increase the burden on others. The costs of risk planning alone can be massive, but are necessary even to get to the starting line with a PPP (Denton 2005).

Skewed priorities: Infrastructure that can be delivered through a PPP may often go ahead while other infrastructure is forced to wait. The fear is that governments, once they have experience with the process and have seen some successes, will skew the decision-making process in favour of the infrastructure that can be delivered via PPPs.

Loss of public accountability and transparency: To accommodate issues of commercial confidentiality and ensure the right conditions exist for a truly competitive process, many PPP negotiations are conducted behind closed doors. As such, PPPs can lower the amount of democratic accountability taxpayers can expect from government. Because service provision is provided privately under a long-term contract, the ability of the public to hold governments accountable is diminished—once a PPP is set in motion, governments are contractually bound, and cannot break the contract without incurring a penalty.

Further, PPP debt-financing is often an off-budget item. This means that the debt does not appear as a liability on the government's balance sheet, but only on the balance sheet of the SPV or private partner. While this preserves the government's debt capacity, it does not mean no future liability exists. In some PPP arrangements, the contract commits the government to make a string of future payments to the private partner over a significant period of time—sometimes 25 or 30 years. These payments may not appear on financial

statements, lowering the public's ability to assess the financial health of the government. Some have complained that PPPs see government trading off the up-front capital costs for a set of future operating costs. This is not the issue—that happens whenever debt-financing occurs. The issue is related to clarity in the government's financial statements.

The validity of these claims, however, is dependent on the specific procedures and processes that have been brought into play. As experience with the process advances, improvements in the solicitation process can solve some of these concerns. In New Brunswick, the Auditor General has suggested that making payments under a PPP for a 30 year period is no different than having to make regular payments of debt service to bondholders, and as such, PPP payments should be recorded as a financial liability (Canadian Union of Public Employees 2004a).

PPPs do not provide new fiscal space: The concept of fiscal space speaks to finding new funding to expand the investment in infrastructure. Because PPP projects can commit government to a future set of payments even if the borrowing is conducted privately, PPPs do not create additional fiscal space in government budgets—they do not amount to new money. However, much also depends on the outcome. If the PPP results in an efficiency gain, then some new fiscal space is created by virtue of the savings that would not have otherwise occurred.

Potential loss of control: In any PPP, the private partner is guaranteed certain rights and rewards for the risks taken on to help finance and deliver an infrastructure system or service. These rights are specified in a long-term contract. But the performance expected is also in the contract. As such, government always retains control over what services are being delivered and the level of those services according to the contract. This is a measure of legal control that government cannot exercise even with its own management and staff. In fact, government has ultimate control at the onset of the PPP process by defining all the infrastructure and service parameters. Thus, the concern here is not with how things are working with PPP in the present, but how things might change in the future. If a PPP is not structured properly, the government may be committing itself to a certain standard of service that may not be appropriate or even needed in the future, or simply become committed to outdated priorities.

In other words, PPPs cannot effectively adapt to changes in future conditions, and therefore, governments cannot change direction either. While the same concern can also exist with traditional public sector procurement, PPPs may aggravate the matter.

Optimal allocation of risk is difficult to achieve, and government always bears the ultimate risk: The success of any PPP is highly dependent on the proper allocation of both risk and reward. PPPs that fail in this regard often fail as a whole. Yet, identifying all the risks and appropriately assigning them is a complex undertaking that does not always succeed. Further, governments will always bear the ultimate risk for any project that goes sideways, especially with large flagship projects (Allens 2000). In such projects, governments have always had to provide a certain measure of support in terms of guaranteeing project debt or taking a partial equity stake in the project. When things go wrong, the PPP turns to the government for assistance. Such was the case with London's Channel Tunnel Rail Link (CTRL). In June 1998, the UK government had to rescue the project by putting up to \$900 million (US) into the project and providing guarantees for another \$9.5 billion (US) in project debt, despite its commitment to provide no loan guarantees or public funds for the project (Allens 2000).

Winning Conditions and Applications

Given the many advantages and disadvantages of PPPs, governments need to give careful consideration to the winning conditions associated with successful PPPs.

Focus on the big picture: PPPs are most effective when a clearly identified public need can be combined with a well-defined private interest. The most successful PPPs occur when the private partner has to directly invest equity in the infrastructure that it will be providing. The government partner must be able to pull off a delicate balancing act: securing the property rights of the private partner and the investors in the contract, while assuring the public that the arrangement is reasonably fair and legitimate (OECD Secretariat 2005).

Accountability: Many accountability concerns can be alleviated through proper research, organizational procedures, and structured performance reviews. Transparency with the public, government managers, and public employees is

critical. All requests for proposals (RFPs) should be made public, and every effort should be made to ensure that the RFP process is competitive. Where possible, bids, contracts, cost information, and other documentation should be submitted to impartial contract auditors throughout the process to enhance accountability. Substantial cost-benefit analysis and independent feasibility studies should be conducted. PPPs must show significant potential to further the priorities of the government and result in a stronger financial advantage over traditional public sector procurement. Ultimately, a PPP must serve and maintain the public interest.

Properly allocate risk: Successful PPPs require finding an optimal sharing of risk between the public and private parties, rather than a government seeking to shift as much risk as it can or keeping so much control that not enough risk is transferred. Transferring too much risk could kill a PPP by making it unaffordable or resulting in windfall profits for the private party. The amount of risk transferred is directly related to the rewards the private partners expect to receive, and no PPP will go ahead when those two are not aligned. Not shifting enough risk entails exposure for the public partner. All the risks need to be identified, assessed, measured, and then allocated to the party who is in the best position to manage that risk and lower it. This is what leads to lower costs, better infrastructure, and a positive PPP outcome. The ability of a project to attract financing often depends on a proper allocation of risk.

Governments must be active: PPPs are not an excuse for governments to pull out of the picture altogether, nor can they expect to do so. Government must be the catalyst for a PPP project, and it may also be required to provide loan guarantees, subsidies, or take an equity position or provide a direct loan. This support is necessary because infrastructure has strong public good characteristics, and the range of marketable infrastructure is relatively narrow. Governments have a role to play in attracting investors, and building the credit worthiness of some projects.

Do not provide guarantees indiscriminately: Government credit enhancements may be needed to get a project off the ground, but these should be used with extreme discretion.

Project selection is key: The most suitable projects for PPP are those where the service requirements are clear, they can

be defined precisely at the outset, and the service offered is not likely to change much over the lifetime of the asset. This prevents governments from locking themselves into a long-term commitment and later finding the service being rendered is less relevant because needs have changed. Infrastructure and services that may have to be altered over time are less appropriate for most PPP arrangements (Kee and Forrer 2002). The infrastructure and services in view must also be monitored and evaluated on a consistent basis. As such, they must lend themselves to some form of objective measurement to ensure compliance with the private sector's responsibilities under the performance contracts in the PPP.

Competition is critical: A PPP constructed in an environment lacking competition among the potential private partners is a recipe for disaster. Most of the biggest advantages of PPP relate to competition, whether it is innovation, the application of technology, keeping costs in control, or providing a quality service. If competition is lacking, the PPP should not go ahead. This also means that governments should be very wary of unsolicited proposals. Such proposals may not speak to the projects that the government wants to tender with PPP, and they can skew the decision-making. In addition, they cannot be compared with other proposals (Ministry of Municipal Affairs, British Columbia 1999).

A strong public sector comparison: In the world of PPPs, one of the most important things a government needs to do is compare the costs and benefits of public sector delivery to the costs and benefits of the various proposals in a PPP. This comparison is often called the public sector comparator or PSC. For every PPP, the public partner first gathers information from its own operation on the costs and risks associated with delivering an infrastructure asset or service. These costs must include all direct costs such as operating expenses, all indirect costs such as overhead, and the range of costs associated with full life-cycle maintenance of the asset in view. The costs of risk management and the potential costs of monitoring under a PPP arrangement must also be included. The transaction costs of negotiating the PPP also need to be factored into the equation. It is extremely important that all costs under the public model be identified and built into the PSC documents. It should then be evaluated by an independent third party (Industry Canada 2001).

Once all the costs have been gathered, the government must

begin benchmarking or developing its own shadow bid to set against the private sector proposals. In the shadow bid, all costs must be analyzed. This includes operating costs, capital costs, a full program of capital maintenance, and financing costs. Costs should be split into direct costs such as salaries, wages, and benefits, and indirect costs such as overhead (Ministry of Municipal Affairs, British Columbia 1999). In the end, the PSC should yield a basic calculation to assess the potential of a PPP and whether it can deliver value for money. If the net present value of all future government payments to the private sector is lower than the costs of the project if it were delivered publicly—or if it meets a certain percentage of that cost as determined beforehand—the government has value for money and a good PPP (Allens 2000).

Realistic expectations: Despite claims to the contrary, PPPs are not a panacea. The approach is limited to infrastructure and services where costs can be determined, performance standards established, and outputs measured (Kitchen 1993; Trebilcock 1994). PPP requires the development of tender specification and as well as continual monitoring to ensure service standards are being met. Not all infrastructure and services lend themselves to this form of rigorous analysis. Governments also need to be realistic in terms of what risks can be transferred, and the level of reward that the private sector needs as compensation for accepting those risks. Insisting that the private partners assume a number of risks without being able to collect on the potential financial rewards is not good PPP policy, and neither are prices that fail to cover costs. Contracts should specify an adequate maximum return, and amounts over and above that can be shared between the public and private partners, or returned to users. In a PPP, governments do not interfere in the operations of the private sector as long as contracts are being honoured.

Build expertise and experience: Governments must learn by doing. One of the first steps is to start developing a PPP team and attracting or soliciting the advice and expertise of individuals who have successfully practiced this form of public policy. These individuals can help craft specific tools and offer advice on minimizing the misgivings of the public, union members, civil servants, and elected decision-makers. There are a number of strategies that need to be learned that help governments cope with the challenges presented by various PPP structures (Walker 1988; Pirie 1987; Goldsmith 1998).

Track record: A government's track record with PPPs is important to potential partners, and it must be carefully built and constantly maintained. Without a positive track record, it is very difficult to generate private sector interest over the long-term. Governments that promise a high return to their private partners but then cave to public pressure by lowering the user fees collected or restricting payments—even if they pay the penalties in the contract—will not attract PPP business. Flip-flops on both broader government policy and independent projects are highly detrimental to public-private partnerships.

Governments considering PPPs should start now to build a track record, but start small. There is no single recipe for success that applies to all infrastructure or services—each has differing financial, economic, and political considerations. However, PPP practitioners consistently advise that the process needs to begin with that infrastructure and those services that offer the highest potential for success, being fundamentally predisposed to PPP and drawing little public interest (Trebilcock 1994). As successes build and expertise and knowledge are gained, a solid foundation is built for future success. It is important to establish a string of successes in an environment where there are more skeptics than fans (Institute for Saskatchewan Enterprise 1990).

Communication: Governments interested in PPPs must build their case by communicating that the search for better and more cost effective and efficient public services is a top priority. Much of the public continues to hold the traditional notion that only a government monopoly can deliver good public services, despite the myriad of research pointing in the opposite direction (Parsons 1994; Institute for Saskatchewan Enterprise 1990; Walker 1988; Pirie 1987). Public-private partnerships are often equated with privatization—and its ideological overtones. As a result, public sector unions are highly resistant (Canadian Union of Public Employees 2004a). The spectre of lay-offs, wage reductions, and the elimination of benefits must be addressed and put to rest. But public sector managers can be resistant as well, and in many ways, present an even stronger barrier than union reluctance. The tendency of bureaucracies to be self-perpetuating is well-documented. Breaking the bureaucratic attachment to the status quo and the financial and psychological investment in existing strategies and policies can be difficult. Bureaucracies tend to work towards maintaining the prevailing organizational

culture by rejecting ideas that could disrupt the equilibrium of power and influence (Seidle 1993). Only a well-defined communication plan and a political champion can overcome the resistance.

A programmatic commitment: Most experts advise that a long-term, programmatic, and incremental approach is the best way to ensure success with public-private partnerships (Pirie 1987). Critical here is not only a firm political commitment, but the intentional creation of a climate that is welcoming. Successful public-private partnering does not occur in a vacuum—countries, provinces, and cities that have successfully employed PPPs are those where there has been a strong and formalized commitment to the concept across a wide range of political actors.

A central component of any programmatic commitment is an overarching national PPP policy that works in conjunction with various provincial PPP policies. The intent of these policies is to provide a clear and transparent legal and regulatory framework that incents private sector involvement. Policies now in effect around the world contain the guidelines for using PPP along with various contract templates and agreements. One thing hampering PPP in Canada is the piecemeal approach and relative lack of federal involvement (Burleton 2002). For example, Partnerships UK is a national policy that guides the PPP process and works to developing the skills to negotiate and carry out successful PPPs. British Columbia has taken a similar approach with BC Partnerships.

Legislative alignment: Broad policies and general political commitment can only take public-private partnerships so far. Various federal, provincial, and municipal laws and regulations that act as an impediment must be reformed, and other legislation more properly aligned to ensure consistency. Typical examples here include government regulations on procurement and finance. The Task Force on Urban Government Renewal of the Saskatchewan Urban Municipalities Association stated that many municipal leaders were not opposed to implementing various PPP options, but provincial restrictions and regulations often formed a wall (Saskatchewan Urban Municipalities Association 1995).

Institutional capacity: An appropriate legal environment must be married to institutional capacity. For example, can

the Canadian banking industry make the necessary reforms required to advance PPPs across Canada? It is generally acknowledged that a weak legal and regulatory framework will stymie public-private partnerships, but so too will the banking industry and the domestic capital market if they do not have the capacity to accommodate PPPs (Rao 2004).

Deal flow: For PPPs to offer any significant potential, governments must be able to keep advancing a steady flow of projects for private participation. If the number of opportunities are far and few between, there will be little pick up within the private sector. A steady flow of potential PPP opportunities is necessary for two reasons. First, it lowers the risks for the private sector. When private actors can pursue a range of opportunities over the long-term, less successful projects can always be offset by the potential for a more successful project in the future.

Second, the private sector needs to develop skills and expertise with PPP arrangements. If the private sector is not confident that the investment in developing this expertise will provide a return, they will not respond. Only when there is a list of opportunities will the private sector make the requisite investments in their personnel. Private sector expertise has to expand beyond a general familiarity with the idea of PPP. The private sector may need to develop new skills with respect to project management, public finance, cost recovery, taxation policy and, public regulations, accounting, contract law, facility operations, real estate appraisal, marketing, and communications. As a first step, governments should develop a register of projects that have been approved for PPP, and make regular additions to the register as new projects are both identified and assessed regarding their suitability for a PPP-based approach. Projects should also be ranked in terms of their priority.

Research and knowledge transfer: Federal, provincial, and municipal governments, along with a wide range of private sector actors from contractors and builders to the financial industry and legal community need to develop the skill set to make the PPP process work. This involves building a research base and then ensuring that can be transferred to all the relevant actors. In some ways, the idea of PPP is re-invents the traditional approach to financing, funding, and delivery infrastructure. In the US, for example, the Federal Highway Administration (FHWA) has partnered with the National

Council on Public-Private Partnerships to hold seminars and training workshops on how to work with PPPs. Workshops are not held on a periodic basis, but they are held around the country on an annual basis. The workshops host state and local government officials, as well as various private sector representatives, in most states right across the nation.

Incentives: In the US, the national Department of Transportation and the Federal Highway Administration, through both TEA-21 and the new SAFETEA, have modified the conditions that attach to some federal grants. Special grants are now available that depend on the recipient using a PPP arrangement in delivering transportation and transit infrastructure. While it is too early to measure the success of these incentives, the idea puts more punch behind the PPP process than a vague commitment to the idea.

Evaluation: Independent mechanisms and institutions should also be devised to focus exclusively on the evaluating PPP arrangements that have been rolled out. This provides an ongoing measure of how well the PPP process is working, and allows continual innovation and refinement in their application. In the UK, the National Audit Office (NAO) reviews all major PPPs, and yet it is also one of the harshest critics (Burleton 2002). In the short-term, a process of independent evaluation is likely to focus on determining whether projects have produced good value for the dollars spent, but the long-term goal is the development of a set of best practices that build expertise right across the nation in working with public-private partnerships.

Standardization: One of the biggest disadvantages with PPPs is the high transaction costs they entail. To the extent that the transaction costs are lowered, more use of PPPs will occur. A key requirement is to develop a certain amount of standardization with respect to PPP contracts, procurement, payment mechanisms, PSC methods, service agreements, lease contracts, construction agreements, facility management contracts, and evaluation tools. Standardization can prevent biases from creeping into the tendering process and lower the risk of poorly constructed performance contracts and concessions (Burleton 2002). Better standardization can also occur across the various types of infrastructure being delivered. One author notes that while there are hundreds of hospitals all across Ontario, no one standard applies in terms of how an emergency room is best constructed and delivered,

meaning the wheel is reinvented every time a hospital is built (Burleton 2002).

A. PPPs FOR OPERATIONS AND SERVICE DELIVERY

A large number of PPP arrangements are struck not to deliver infrastructure, but to deliver a service or operate and maintain a facility. In the world of PPP parlance, these are O&M arrangements. Such PPPs do not speak to delivering infrastructure directly, but they often result in savings in the operating budget—savings that can be redirected to support capital.

Service Contracts (purchasing inputs)

A service contract is a very simple PPP arrangement where a government purchases certain inputs that it needs as opposed to producing them in-house. The idea is to find cost savings through competition among the various providers, reduced overhead, and lower fixed costs. In standard service contracting, only private providers are allowed to compete by submitting a bid. Typical examples of service contracts include government printing, administration, staff training, research, property assessment and appraisal, meter reading, and billing. These are very short contracts generally lasting from 1-2 years.

Alternative Service Delivery (purchasing outputs)

Alternative service delivery (ASD) often comes with a wide variety of labels including contracting out, outsourcing, and competitive procurement. The idea behind an ASD type PPP is to inject a certain measure of competition into the provision of public services as a way to increase efficiency and improve service delivery. Unlike a service contract, ASD is concerned with the provision of outputs to the public. Competition is often introduced by the government pulling back as the sole monopoly provider, and breaking a city or province into various regions. Private contractors are then invited to bid for the rights to deliver a specific service or set of services to the public. A competitive environment is maintained by limiting the number of regions in which any one private provider can operate (Slack 1996).

Numerous studies comparing the costs of public and private sector delivery of various municipal services have been conducted in the United States, Canada, and across Europe (Bish 2001; Institute for Saskatchewan Enterprise 1990;

Public Private Partnerships: Examples

PPPs are an international phenomenon. According to the World Bank, which maintains a PPP database, private participation in direct infrastructure investment grew from \$16 billion (US) in 1990 to more than \$120 billion in 1997. Since then, there has been a decline of about 20%, largely because of the financial crisis that gripped southeast Asia in the late 1990s (Lenard 2002). PPPs are used the most in the UK, followed by Australia, and then countries in southeast Asia. The US has also used PPPs, particularly for some very large and high profile urban transportation projects. PPP usage in Canada is in its infancy, but the number of examples is growing.

THE UNITED KINGDOM:

From the early 1990s to 2003, over 600 PPP projects valued at £56 billion have been signed in the UK. This includes the Channel Tunnel (Chunnel), the Channel Tunnel Rail Link (CTRL) to London, and the development of the London Underground (an integrated subway system). Most of the PPP deals have been signed since 1997. Over £5 billion in PPP projects were signed in 2005 alone, encompassing various utility projects, 10 hospitals, and a number of schools. Across the UK, transportation accounts for 66% of all PPPs, defence for 7%, health care for 7%, education for 4%, environmental infrastructure for 2%, and miscellaneous projects for 14%.

UK government reports indicate that privately financed infrastructure has delivered savings averaging about 17% over comparative public sector infrastructure. The National Audit Office (NAO) of the UK has determined that 24% of PPP projects were late compared to 70% for public sector projects, and that cost over-runs occurred in only 22% of PPPs compared to 73% for public sector projects (Burleton 2002). This success has been overshadowed by the more controversial Chunnel projects.

The Channel Tunnel: \$19 billion (US): This is one of the world's largest PPP projects, and it is not typical. The contracts were signed in 1986, and construction began in 1987. The project opened in 1994. The cost in 1987 was estimated at 7.5 billion euro (in 1987 prices). As the project progressed, costs increased to over 16 billion euro due to construction problems and delays. Most of the additional loans were covered by additional debt. Due to the cost escalation, the sponsoring governments had to increase the concession period for the private consortium from an original term of 55 years to 99 years. Revenues have still not met expectations. The vehicle traffic was predicted accurately, but truck traffic has failed to meet expectations given competition from various ferries (Vickerman 2002).

Channel Tunnel Rail Link: \$10 billion (US): The Channel Tunnel Rail Link is a 120 km line connecting London to the Channel Tunnel. In June 1998, the UK announced it would be putting anywhere from \$350 billion to \$900 billion (US) of public money into this PPP project to rescue it from failure. In addition, the government had to provide guarantees to reduce the costs of the \$9.5 billion (US) in project debt. The National Audit Office has deemed the project poor value for the money. In advancing the project, the government had always insisted it would provide no guarantees.

AUSTRALIA:

PPPs emerged in Australia in the late 1980s when state governments introduced some formal procedures and various controls on the practice. In 1992, the federal government introduced various tax benefits for the private financing of infrastructure. The PPP market was heavily concentrated in the state of New South Wales until 1994, when a range of PPP projects started to take off in the other states, particularly Victoria. Across Australia, PPPs have covered a wide swath of government functions, including hospitals, water and waste systems, prisons, stadiums, rail, ports, airports, transportation, electrical power, gas, and communications. PPP was also used to deliver a variety of the venues needed for the 2000 Sydney Olympics. In 2004, the Australian Council for Infrastructure Development found over 200 PPP projects nationwide with a total investment of some \$113 billion. The state of Victoria has found that savings due to PPPs have been as high as 30% for water and wastewater facilities, and as low as 3% for various transportation projects.

Each state in Australia has developed guideline documents regulating PPP activity, standardizing contracts, and outlining how state and local governments should proceed. Working With Government was released by the state of New South Wales in November 2001, and allows PPPs for projects exceeding \$20 million. Partnership Victoria was released in June 2000, and allows PPPs for projects in excess of \$10 million. Public Private Partnership was released in Queensland in September 2002, and restricts PPP to projects where the whole life costs exceed \$50 million. Partnership South Australia was released in September 2002, and Partnerships for Growth was released by the state of Western Australia in December 2002. Both have no value thresholds for PPP projects.

Public Private Partnerships: Examples (continued)

Australia boasts three flagship PPP projects, including the Sydney Harbour Tunnel valued at \$750 million (AUD) and the M2, M5, and M54 Roadways at a combined value of \$1 billion. The most interesting PPP project is a set of tolled roadways in the City of Melbourne—the Melbourne City Link. The Melbourne City Link Authority was established in 1994 to oversee construction of a privately funded road network running through the centre of the City. A 34-year concession contract worth \$1.25 billion (US) was awarded to a private consortium. Construction of the 22 km roadway started in 1996, and features electronic traffic management systems and automated toll collection transponders. As of May 2000, over 520,000 transponders had been issued and 340,000 vehicles used the system daily.

CANADA:

PPPs in Canada have largely been confined to several high profile energy developments and infrastructure projects. Examples include the early development of the Alberta Oil Sands and the Hibernia project (\$4.4 billion). Recent infrastructure PPPs include Confederation Bridge, a \$1 billion 13 km long fixed link connecting PEI and New Brunswick. The toll bridge was designed, financed, and constructed by Strait Crossing Development Inc., which also has a 35-year concession. The Fredricton-Moncton Highway in New Brunswick was developed through a design-build-operate PPP initially funded by tolls. The tolls were later removed because of opposition, and the government is now paying shadow tolls. The province of Nova Scotia used PPP to build 8 schools in 1998. All were turnkey PPPs built to spec for a 20-year term. The lease payments are only 85% of the costs of construction since the private owner is earning additional income by leasing the buildings during non-school hours (Burleton 2002).

Increasingly, PPP projects at the local level are emerging. In Moncton, NB, US Filter and the Hardman Group partnered with government for a design-finance-build-operate PPP for a new \$85 million water treatment plant in 1999. The PPP is a 20-year concession, and has guaranteed the level of user charges for the duration of the contract. The estimated savings over 20 years is \$12 million. The City of Winnipeg used a PPP to finance and build the new Charleswood Bridge, which also involved a 30-year concession. The Regional Municipality of Halton employed a design-finance-build-own-operate PPP for a new recycling facility. PPPs appear to be advancing the fastest in Alberta and British Columbia. A new courthouse high-rise in downtown Calgary and a new ring road in Edmonton are both being delivered through PPPs. In BC, a new rapid transport line is being developed in Vancouver, and other PPP projects include a hospital in Abbotsford, the Fraser River Crossing, the Kicking Horse Canyon project, the Okanagan Lake Bridge, and improvements to the Sea-to-Sky Highway for the 2010 Winter Olympics.

In other areas of the country, it is management contracting through PPP that has garnered the most attention. Hamilton, ON signed a 10-year management contract with Philips Utilities for several water and wastewater plants. The PPP guarantees \$700,000 in savings annually over the term of the contract. Similar contracts have been signed in Dartmouth, NS and Banff, AB. Sarnia-Lambton has signed a 25-year contract with Philip Environmental for solid waste management, and a similar agreement has been signed in Etobicoke, ON.

UNITED STATES:

In the US, PPPs have been used to deliver some very large transportation infrastructure, particularly new toll roads. High-profile projects include the Denver E-470, a new \$722 million (US) 80 km long toll road in the Denver metro area, and the SR-125, a new \$635 million highway connecting San Diego to the larger regional freeway system. A 35-year concession was awarded in 1991 under a PPP. After years of delay, the Star-125 is expected to open in 2007. But much of the current focus is on Texas. The Trans-Texas Corridor Initiative is the largest transportation proposal in the US—a 1,300 km long transportation corridor including rail, roads, and dedicated utility infrastructure stretching from Oklahoma to Texas. Several projects in the corridor were announced in late 2003. CINTRA has been awarded the contract to build a new road connecting Dallas to San Antonio by 2010 at a cost of \$6 billion, and is now negotiating a concession for maintenance and operations over the next 50 years. The Central Texas Turnpike is a new \$4 billion 200 km toll road.

In the US, some of the more interesting examples involve operation and maintenance PPPs. In Atlanta, the water and wastewater infrastructure was out of compliance with federal and state environmental standards, and citizens were facing at least a 100% increase in rates to bring the systems back into compliance. Atlanta signed a PPP with Lyonnaise des Eaux and United Water to make the needed investments. Rate increases were held to 30% (Schmidt 2000). Lyonnaise des Eaux has also partnered with Indianapolis. That City saw a 44% savings over the 10 year PPP, returning over \$150 million to ratepayers (Vander Ploeg 2004a).

Walker 1988; Kitchen 1993.) Depending on the activity, private production can yield savings in the range of 15% to 30%, with occasional savings of 50% (Love and Cox 1991). Research suggests that the savings accrue from increased employee productivity related to newer technology and the more intense use of capital equipment (Kitchen 1993; Trebilcock 1994; Institute for Saskatchewan Enterprise 1990; Walker 1988).

Although the name might be unfamiliar, ASD is not a new concept, and is a well-established practice in many small towns and cities across Canada and the United States. Some smaller municipalities are essentially contract-towns where most outputs are purchased from private contractors. In large metropolitan centres, the use of ASD is typically restricted to a narrower range of activities (Walker 1988; Institute for Saskatchewan Enterprise 1990). It has been suggested that smaller municipalities, lacking the fiscal capacity, competitively contract to secure lower costs while larger metropolitan centres have more financial resources, a broader service area, a larger bureaucracy, and a stronger union lobby. All may contribute to a tendency toward monopoly control.

Operations and Maintenance Contracts

Management contracting takes ASD a step further by contracting out the management of various outputs as well as the actual delivery. In ASD, management functions remain with the public sector, but here management is handed off to a private partner through a competitive tendering process. The idea with management contracting is to allow private partners greater freedom in deciding how to deliver a service, and then compensating the contractor based on performance. In France, this is how much of the nation's water supply and wastewater treatment is carried out (United Nations Secretariat 1995).

The primary vehicle here is an operations and management or O&M contract. Such contracts include responsibility for operations, as well as maintenance of the infrastructure related to that service. O&M contracts are essentially a wholesale—though temporary—transfer of management responsibility from public sector managers to external private managers. Throughout the contract, the public sector retains ownership of the assets and is also responsible for any major long-term investments in the infrastructure.

Many O&M contracts are signed on a basis where the private partner guarantees a set price to the government or the individual users over the course of the PPP term, and also guarantee a specific amount of savings. The maximum length of these arrangements is usually about 20 years, with 10 years being the average. Thus, these contracts are best described as a franchise agreement.

Managed Competition

With managed competition, the role of the private sector is to compete with public managers and employees for the rights to deliver a specific service. In all the other models, the competition exists external to government. With managed competition, the competitive impulse is brought into the public operation. Any number of specific PPP arrangements may result depending on whether the public sector wins the competition or the private sector. In Indianapolis, over 85 municipal services were eventually subjected to managed competition by 1999. Municipal employees were quite successful in lowering costs and winning competitions, and this grew over time. In the beginning of the initiative, municipal workers won about 25% of the competitions and split service delivery with private partners for another 20%. As the process moved along, public workers were winning 80% of the competitions (Holle 1996).

Proponents of managed competition assert that the problem is not with public delivery or public employees and managers, but with a system that lacks competition and works top-down by over-regulating and over-managing employees. The Indianapolis experiment has generally been well received, and resulted in significant savings that were leveraged to pull together a \$1.3 billion infrastructure reinvestment program (Vander Ploeg 2004a).

The challenge with a managed competition approach to PPP is to ensure that public employees have the resources to effectively engage in competition on the one hand, and that they do not have a significant advantage against private bidders on the other. In Indianapolis, the City paid for consulting teams to provide employees and managers with the ability to bid against the private sector (Goldsmith 1998). For added incentive, employees also shared in some of the cost savings. But for competition to work, the playing field

must stay level over the long-term. Some of the lustre has come off the idea of managed competition because a truly competitive environment could not be maintained. Today, many private contractors will not respond to invitations to compete where an employee bid will also be considered (Joyner, Steckler, and Wolf 2003).

B. FAMILIAR PPP CONFIGURATIONS FOR EXISTING INFRASTRUCTURE

When an existing infrastructure asset or facility needs significant repair, improvement, or rehabilitation, a public-private partnership often takes the form of an O&M franchise agreement combined with a lease. In these PPPs, the infrastructure is leased for a relatively short period of time, during which the private lease operator is responsible for operations and maintenance, as well as making a significant investment in the infrastructure. The lease terms are negotiated for a fixed period of time that will allow the private party to recover its capital costs and earn a return. The PPP terms require the infrastructure to be upgraded to a certain condition and later transferred to the government partner. During the process, careful monitoring and oversight occur.

Leasing transfers the responsibility of ownership to the private sector, but not the legal ownership. Such public-private partnership structures tend to run from between 25-30 years, but can also be shorter for infrastructure that has a faster payback period. Compared to the standard O&M contract, a lease arrangement allows the private operator more freedom to reduce long-term costs and improve revenues. In most lease scenarios, the private operator is also responsible for collecting user fee revenue directly from users, and thus, carries more of the commercial risks associated with the infrastructure and its related service. Unlike the sale-leaseback, up-front payments are not usually part of these arrangements.

Public-private partnerships organized around leasing typically involve some or all of the following: leasing (L), financing (F), operating (O), building (B), and transfer (T). The main difference between the various types occurs with how many activities are actually involved and how they line up sequentially. All lease agreements involve a transfer (T) of the facility at some point in the future, but may not include a financing component. In an LFBOT, the facility is leased, financing for the improvements

is arranged, building occurs, and then operations commence. These PPP structures are sometimes called wrap-arounds. In an FBLBOT, the financing is arranged by the private partner first and substantial upgrades are made while operations have been closed down. A lease is then signed for the finished facility and operations commence. Lease-based PPPs are essentially an outsourcing of capital expenditures.

C. FAMILIAR PPP CONFIGURATIONS FOR NEW INFRASTRUCTURE

PPPs are usually used to construct new infrastructure. The most popular PPP is a DFBOT—design (D), financing (F), building (B), operations and maintenance (O), and transfer (T). Here, all aspects of the infrastructure are handled by the private sector, but ownership rests with the public sector. The private party designs, finances, builds, and operates the infrastructure, after which the rights of ownership and the responsibility for operations are transferred back to government.

SUMMARY OF PPPs

PPPs offer the prospect of efficiency, value for money, improved long-term capital asset management, and better pricing practices. However, their application is currently limited, and they take a lot of work to put together. If Canadian governments are going to benefit from PPPs in a significant way, then a long-term programmatic commitment must be made. The current piecemeal approach will continue to suppress the potential of PPPs.

PPPs have to be structured properly and project selection is critical. When governments are confronted with a new, large, and highly technological project with significant up-front costs, a relatively long period of construction, and a long asset life, a PPP may make sense. Hard economic infrastructure that entails very few issues of distributional equity is the best fit. The fit improves considerably if the infrastructure is marketable and will generate its own stream of revenue, and if it would benefit from a more independent approach to regulation. PPP projects must involve infrastructure that can stand-alone. Most importantly, the costs of constructing and operating the infrastructure must be accurately compared between public and private delivery. Outcomes must be measurable and monitoring has to be relatively straightforward.

4. Other Innovations

See pages 22-23 of Part I for a discussion of tools A-F: strategic capital asset management, maximizing existing capacities, infrastructure demand management strategies, reform of standards, accrual accounting, and activity-based accounting.

G. DONATIONS AND SPONSORSHIPS

Corporate sponsorships allow private companies to purchase public recognition through advertising in exchange for a donation or contribution to a valuable civic infrastructure project. Donations from other civic organizations are also a possibility (National Guide to Sustainable Municipal Infrastructure 2002). While such donations will only amount to a “drop in the bucket” relative to the infrastructure funding challenges facing Canada’s cities, it would help set the stage for future collaboration and begin the process of teaming with the private sector. Effective partnerships between the public and private sectors require the development of a specific set of skills. Starting by developing a corporate donorship program is one way to crack the door open on PPPs and begin working with the concept in a small, yet practical way.

H. COMMUNITY AND NEIGHBOURHOOD “SELF-HELP” PROGRAMS


Some forms of infrastructure such as small parks and recreation centres are ideal candidates for improvements undertaken within the community itself through a very highly decentralized process. People do not often give infrastructure the notice it deserves—it is taken for granted and rarely given a second thought. However, governments can implement community improvement programs that encourage local citizens to assume some of the responsibility directly. Such initiatives will foster a stronger sense of ownership in the community as people band together to improve their own environments.

I. POOLED PURCHASING AND RESOURCE SHARING

Many local governments are currently heavily involved in purchasing operational inputs through various pooled purchasing schemes operated through provincial municipal associations and other forms of cooperation. To the extent that a group of more functional standards for infrastructure

can be put in play, the concept could be made of more direct relevance to infrastructure. This would facilitate the volume purchasing of a number of various “ready made” infrastructure components that can be applied in virtually any municipality. While the idea might offer relatively few benefits in the short-term, as the process is refined and expanded, the benefits will grow.

J. SMALL SCALE PRIVATE INFRASTRUCTURE

Advancements in technology continue to open the door on new approaches to infrastructure that were not possible in the past. In some communities in the US, new developments with as few as 100 homes are economically providing their own water and wastewater infrastructure independent from the service being provided publicly. 

Bibliography

- Acumen Consulting Group; Dillon Consulting; IBI Group; Lapointe Consulting; and Paterson Planning and Research Ltd. 1999. *Public-Private Partnerships in Municipal Infrastructure*. Canada Mortgage and Housing Corporation (CMHC). Ottawa, Ontario.
- Adams, John S.; Cidell, Julie L.; Hansen, Laura J.; Jung, Hyon-Joo; Ryu, Yeon-Taek; and Van Drasek, Barbara. 1999. *Development Impact Fees for Minnesota? A Review of Principles and National Practices*. Center for Transportation Studies at the University of Minnesota. Minneapolis, Minnesota. (http://www.cts.umn.edu/trg/research/reports/TRG_03.html)
- Advisory Commission on Intergovernmental Relations. 1984. *Financing Public Physical Infrastructure*. Washington, DC. (<http://www.library.unt.edu/gpo/acir/Reports/policy/a-96.pdf>)
- Advisory Commission on Intergovernmental Relations. 1992. *Toward a Federal Infrastructure Strategy: Issues and Options*. Washington, DC. (<http://www.library.unt.edu/gpo/acir/Reports/policy/a-120.pdf>)
- Alberta Urban Municipalities Association (AUMA). 2000. *AUMA's 50% Education Tax Cut Proposal*. Alberta Urban Municipalities Association. Edmonton, Alberta. (<http://www.muniilink.net/policy/keyPolicies/EducationTax.doc>)
- Allen Consulting Group. 2003. *Funding Urban Public Infrastructure: Approaches Compared*. A report prepared for the Property Council of Australia. Canberra, ACT, Australia. (<http://www.propertyoz.com.au/nsw/advoc/subs/Urban%20Infrastructure%20Allen%20Consulting%20Report.pdf>)
- Allens Arthur Robinson. 2000. *Funding Public Transport Infrastructure in the UK: Private Finance and Risk Transfer*. A paper presented at the 23rd Australasian Transport Research Forum held in Perth, Western Australia, from September 29-October 1, 2000. Allens Arthur Robinson. Sydney, NSW, Australia. (<http://www.aar.com.au/pubs/baf/fofsep00.htm>)
- Anderson, Rich. 2000. *Mayors Discuss Pressing Infrastructure and Regulatory Issues*. An article written for www.usmayors.org. (http://www.usmayors.org/uscm/us_mayor_newspaper/documents/07_17_00/urban_article.html)
- Asian Development Bank. 2004. *Infrastructure in East Asia: The Way Forward*. Tokyo, Japan. (<http://www.adb.org/Documents/News/2004/pr2004001.pdf>)
- Association for Governmental Leasing and Finance. 2000. *An Introduction to Municipal Lease Financing: Answers to Frequently Asked Questions*. Washington, DC.
- Association of Colleges of Applied Arts and Technology of Ontario (ACAATO). 2004. *ACAATO Position Paper on Investing in Ontario's Infrastructure*. Association of Colleges of Applied Arts and Technology of Ontario. Toronto, Ontario. (<http://www.acaato.on.ca>)
- Athens-Clarke County. 2003. *SPLOST Annual Report 2003*. Athens-Clarke County, Georgia. (<http://www.athensclarkecounty.com>)
- Athens-Clarke County. 2005. *SPLOST: Special Purpose Local Option Sales Tax*. Athens-Clarke County, Georgia. (<http://www.athensclarkecounty.com/splost/index.htm>)
- Atlanta Regional Commission. 2003. *Draft Transportation Funding Alternatives Report*. Atlanta, Georgia. (<http://www.atlantaregional.com/cps/rde/xchg/>)
- Augusta Richmond County. 2005. *SPLOST V Proposal*. Augusta Richmond County, Georgia. (<http://www.augustaga.gov/misc/splost/home.asp>)
- Australian Government Solicitor. 2005. *Commercial Notes*. Australian Government Solicitor. Canberra, ACT, Australia. (<http://www.ag.gov.au/publications/agspubs/legalpubs/commercialnotes/ComNote16.htm#three>)
- Azmier, Jason and Dobson, Sarah. 2003. *The Burgeoning Fringe: Western Canada's Rural Metro-Adjacent Areas*. Canada West Foundation. Calgary, Alberta.
- Balboa Capital. 2006. *Municipal Lease Program*. Balboa Capital. Irvine, California. (<http://www.balboacapital.com>)
- Barton, Dianna. 2003. *Letter to Mayor and Council*. Saint John Board of Trade. Saint John, New Brunswick. (<http://www.sjboardoftrade.com/BoardNews.asp?ID=107>)
- Batt, William H. 2001. "Value Capture as a Policy Tool in Transportation Economics: An Exploration in Public Finance in the Tradition of Henry George." *American Journal of Economics and Sociology*. (January 2001). Blackwell Publishing. Malden, Massachusetts. (http://www.findarticles.com/p/articles/mi_m0254/is_1_60/ai_74643767)
- BDO Dunwoody and Associates and the Heavy Construction Association of Regional Niagara. 2001. *The Case for Increased Infrastructure Investment in the Region of Niagara*. (<http://www.hcarn.com/Whatsnew.htm>)
- Bech-Hansen, John. 2002. *Tax-Exempt Bonds*. Municipal Finance Officer's Association of Ontario. Toronto, Ontario.
- Berthelot, Curtis; Gardiner, Angela; and Taylor, Brian. 2001. *Data Collection Needs for Public-Private Highway Facilities*. A paper delivered to the Finance-Design-Build-Operate-Maintain: The Canadian Experience Workshop of the 2001 Annual Conference of the Transportation Association of Canada, held in August 2001 in Halifax, Nova Scotia, Canada. (http://www.irdinc.com/english/pdf/tech_ppr/TACDataCollectionNeeds)
- Better Environmentally Sound Transportation (BEST). 2002. *Comments on the BC Government's Draft Public Policy Paper: Creating Opportunities for Expanding Transportation Infrastructure and the Draft Transportation Investment Act*. Vancouver, British Columbia. (http://www.best.bc.ca/_etc/pdfs/policy/position_paper_Sept_2002.pdf)
- Bish, Robert L. 2001. *Local Government Amalgamations*. CD Howe Commentary No. 147. CD Howe Institute. Toronto, Ontario.
- Brittain, Len S. 2002. "Financing Capital Expenditures." *Canadian Tax Journal*. Vol. 50, No. 2. Canadian Tax Foundation. Toronto, Ontario. (http://www.ctf.ca/pdf/ctjpdf/2002ctj2_brittain.pdf)
- Burleton, Derek. 2002. *A Choice Between Investing in Canada's Cities or Disinvesting in Canada's Future*. TD Economics and the TD Bank Financial Group. Toronto, Ontario.
- Burleton, Derek. 2004. *Mind the Gap: Finding the Money to Upgrade Canada's Aging Public Infrastructure*. TD Economics and the TD Bank Financial Group. Toronto, Ontario.
- Business and Economic Research Center. 2003. *Potential Sources of New Revenue for Rutherford County*. Business and Economic Research Center at Jennings A. Jones College of Business, Middle Tennessee State University. Murfreesboro, Tennessee. (<http://www.mtsu.edu/~berc/pdfs/revenuerutherford.pdf>)
- Cairney, Richard. 2002. "The Fate of Edmonton's Ground-level LRT Expansion is up in the Air." *Express News* (March 11, 2002). The University of Alberta. Edmonton, Alberta. (<http://www.expressnews.ualberta.ca/article.cfm?id=2145>)
- California Budget Project. 1999. *California's Public Investment Gap: Financing Infrastructure Issues and Implications*. California Budget Project. Sacramento, California. (<http://www.cpb.org/1999/bb990901.html>)
- California Infrastructure and Economic Development Bank (IBANK). 2003. *Low Cost Infrastructure Financing: Infrastructure State Revolving Fund Program*. State of California. Sacramento, California. (http://www.commerce.ca.gov/tcca/pdfs/detail/inf_bank/Brochure_ISRF_4-8-03.pdf)
- Canada Mortgage and Housing Corporation (CMHC). 1999. *Alternative Methods of Financing Municipal Infrastructure*. Canada Mortgage and Housing Corporation. Ottawa, Ontario.
- Canadian Federation of Independent Business (CFIB). 2002. *Focus on Edmonton: Small and Medium-sized Enterprises' Perspectives on City Issues*. Canadian Federation of Independent Business. Ottawa, Ontario. (<http://www.cfib.ca/legis/alberta/pdf/5142.pdf>)
- Canadian Society for Civil Engineering. 2002. *Critical Condition: Canada's Infrastructure at the Crossroads*. Montreal, QC. (<http://www.csce.ca/PDF/FRM/%20Minister%20Brief.pdf>)
- Canadian Taxpayers Federation. 2002. *Filling the Infrastructure Gap*. (<http://www.taxpayer.com/pdf/GasTaxReport2002.pdf>)
- Canadian Union of Public Employees (CUPE). 2004(a). *A CUPE Backgrounder on Urban Infrastructure*. Canadian Union of Public Employees. Ottawa, Ontario.
- Canadian Union of Public Employees (CUPE). 2004(b). *Investing in Infrastructure: Strategies for Keeping it Public*. Canadian Union of Public Employees. Ottawa, Ontario. (http://www.communities.cupe.ca/updir/communities/Investing_in_Infrastructure.pdf)

- Cannadi, John and Dollery, Brian. 2004. *An Evaluation of Private Sector Provision of Public Infrastructure in Australian Local Government*. University of New England School of Economics. Armidale, NSW, Australia. (http://www.une.edu.au/economics/publications/econ_2004_05.pdf)
- Capka, Rick. 2005. *The Future of Highway and Public Transportation Financing*. Remarks by Federal Highway Acting Administrator Rick Capka to the U.S. Chamber of Commerce. U.S. Department of Transportation, Federal Highway Administration. Washington, DC. (<http://www.cf.fhwa.dot.gov/pressroom/re051103.htm>)
- Caplan, David. 2004. *Remarks to the Ontario Realty Corporation Infrastructure Symposium*. May 27, 2004. Ministry of Public Infrastructure Renewal, Government of Ontario. Toronto, Ontario. (http://www.pir.gov.on.ca/userfiles.HTML/cma_4_35623_1.html)
- CCH Tax and Accounting. 2006. "Leasing Advantages" and "Leasing Disadvantages" in the *CCH Business Owner's Toolkit*. CCH Tax and Accounting. Riverwood, Illinois. (<http://www.toolkit.cch.com>)
- CD Howe Institute. 2002. *Message to the Cities: If You Don't Like Sprawl, Don't Make it Worse*. CD Howe Institute. Toronto, Ontario. (http://www.cdhowe.org/pdf/commentary_160.pdf)
- Centre for Policy and Development Systems (CPDS). 2002. *About Public-Private Partnerships*. Centre for Policy Development Systems. Brisbane, Queensland, Australia. (<http://cpds.apana.org.au/Teams/Articles/ppp.htm>)
- Centre for Policy and Development Systems (CPDS). 2003. *QCU Government Services: Revenue Forum*. Centre for Policy Development Systems. Brisbane, Queensland, Australia. (http://cpds.apana.org.au/Documents/Crisis_in_GQ/Articles/revenue_and_spending.htm)
- Cervero, Robert and Duncan, Michael. 2002. *Land Value Impacts of Rail Transit in San Diego County*. National Association of Realtors and the Urban Land Institute. Washington, DC. ([http://www.realtor.org/SG3.nsf/files/sandiego.pdf/\\$FILE/sandiego.pdf](http://www.realtor.org/SG3.nsf/files/sandiego.pdf/$FILE/sandiego.pdf))
- Chege, Lucy. 2001. *Recent Trends in Private Financing of Public Infrastructure Projects in South Africa*. CSIR Building and Construction Technology. Brummeria, Pretoria, South Africa. (<http://www.csir.co.za/websource/pt10002/docs/boutek/akani/2001/july/public.pdf>)
- Cities Alliance. 2005. *Empowering Cities to Attract Finance*. Cities Alliance. Washington, DC. (<http://www.citiesalliance.org/doc/annual-reports/2005/ch-1.pdf>)
- City of Albany-Dougherty County. 2004. *SPLOST General Information*. Albany-Dougherty County, Georgia. (http://www.albany.ga.us/engineering/eng_splost.htm)
- City of Calgary. 1990. *Annual Report of the Corporation of the City of Calgary*. Calgary, Alberta.
- City of Durham. 2002. *Revenue Sources*. City of Durham 2002-2003 Budget. City of Durham. Durham, North Carolina. (<http://www.ci/durham.nc.us/departments/bms/02-03budget/q03.pdf>)
- City of Hamilton. 2001. *100 Year Report: Infrastructure Asset Management Strategy (IAMS)*. Hamilton, Ontario.
- City of Lawrence Public Improvement Task Force. 2004. *White Paper*. City of Lawrence. Lawrence, Kansas. (http://www.lawrenceks.org/web_based_agendas/06-15-04/PITF_White_Paper.html)
- City of Moorhead. 2004. "Appendix C: Financial Toolbox." *Moorhead, Minnesota Comprehensive Plan*. City of Moorhead. Moorhead, Minnesota. (<http://www.ci.moorhead.mn.us/>)
- City of Ottawa. 2005. *Long-Range Financial Plan: First Steps*. City of Ottawa. Ottawa, Ontario. (http://www.ottawa.ca/city_hall/financial/lrfp_exe_summ_en.html)
- City of Phoenix. *Funding and Financing New Infrastructure*. A power point presentation by the City of Phoenix. Phoenix, Arizona. (http://www.azplanning.org/APA%20Financing%20wo%20grap_hics.ppt)
- City of Regina. 2001. *Brief on Provincial Issues From Regina City Council to Members of the Legislative Assembly*. Regina, Saskatchewan.
- City of Toronto. 2000. *Comparison of Powers and Revenue Sources of Selected Cities*. Toronto, Ontario. (http://www.canadacities.ca/caoreport_062000.htm#5)
- City of Winnipeg. 2000. *Achieving Affordable Government for a Sustainable Winnipeg*. Winnipeg, Manitoba.
- Civic Lease. 2006. *Leasing Advantages*. Civic Lease. El Dorado, California. (http://www.civiclease.com/leasing_advantages.htm)
- Clemens, Jason; Emes, Joel; and Scott, Rodger. 2002. *The Corporate Capital Tax: Canada's Most Damaging Tax*. Public Policy Sources: A Fraser Institute Occasional Paper. Fraser Institute. Vancouver, British Columbia.
- Cobb County School District. *Special Purpose Local Option Sales Tax: Your Tax Dollars at Work*. Cobb County, Georgia. (<http://www.cobb.k12.ga.us/communications/splost/index.htm>)
- Cohen, James K. 2002. *Innovative Uses of Credit for Financing Infrastructure: Historical and Contemporary Perspectives*. Cuny Institute for Urban Systems, the City College of New York. New York, New York. (<http://www.cuny.cuny.edu/cius/documents/InnovativeFinance-Report.pdf>)
- Cohen, Remy; Freixas, Xavier; Sheehy, Robert; and Trujillo, José A. 1997. *Infrastructure Financing With Unbundled Mechanisms*. Inter-American Development Bank. Washington, DC. (<http://www.iadb.org/sds/doc/1208eng.pdf>)
- Comeau, Sylvain. 2001. "In Conversation With Saeed Mirza." *McGill News: Alumni Quarterly*. Summer 2001. McGill University. (<http://www.mcgill.ca/news/archives/summer2001/mirza/>)
- Commission on Building for the 21st Century. 1999. *Initial State Infrastructure Report*. State of California. Sacramento, California. (http://www.ltg.ca.gov/office_of/responsibilities/infra99.asp)
- Commission on Building for the 21st Century. 2001. "Chapter 5: Financing Infrastructure for the 21st Century." *Invest for California: Strategic Planning for California's Future Prosperity and Quality of Life*. State of California. Sacramento, California. (<http://www.bth.ca.gov/invest4ca/21.pdf>)
- Congressional Budget Office. 1988. *New Directions for the Nation's Public Works*. Washington, DC. (<http://www.cbo.gov/ftpdoc.cfm?index=5544&type=1>)
- Connery, Allan. 2003. "Home Levies Like Too Little Poison." *Calgary Herald*. March 26, 2003. Calgary, Alberta.
- Cooper, Jeffrey M. and Pawson, Mary Grace. 2005. *Bringing Home the Bacon: Creative Infrastructure Financing at the Local Level*. American Public Works Association (APWA). Washington, DC. (http://www.apwa.net/publications/reporter/reporteronline/index.asp?DISPLAY=ISSUE&ISSUE_DATE=012002&ARTICLE_NUMBER=320)
- Cordingley, Frank. 2004. "Mater Hospital and Public Private Partnerships." *Joint Medical and Health Sciences Newsletter* (March 2004). Mater Hospitals, Brisbane, Queensland, Australia. (http://www.vha.org.au/content/Publications/Library/Cordingley_Mater%20Hospital%20and%20Public%20Private%20Partnerships.pdf)
- Coyne, Andrew. 2005. *For Sale: Ontario Roads, Transit*. (www.AndrewCoyne.com/2005/05/blog-post_09.php)
- Cunliffe, David. 2002. *The Role of Government in Infrastructure Funding*. A speech at the conference Establishing and Funding Public and Private Sector Partnerships: Practical Lessons From Overseas Applied to New Zealand. Held August 28, 2002. (<http://www.cunliffe.org.nz/6.news/articles/details.asp?id=42>)
- Das Gupta, Debasree; Gunaydin, Günsel H.; London, James B.; Saltzman, Ellen W.; and Shah, Rajeev. 2002. *State Transportation Funding Trends and Comparative State Assessment*. Transportation Funding Series Special Report No. 2. The Jim Self Center on the Future at the Strom Thurmond Institute of Government & Public Affairs. Clemson, South Carolina. (<http://www.strom.clemson.edu/publications/london/transport.html>)
- Davey, Keith. 2005. "Making Tough Choices: A New Approach to Infrastructure Decisions." *OGRA's Milestones*. Vol. 5, No. 1. Ontario Good Roads Association (OGRA). Mississauga, Ontario. (<http://www.ogra.org/lib/db2file.asp?fileid=9903>)
- Davidson, Sidney; Mitchell, C.L.; Stickney, Clyde P.; Weil, Roman L. 1986. *Financial Accounting: An Introduction to Concepts, Methods, and Uses*. (3rd ed.) Holt, Rinehart and Winston of Canada Ltd. Toronto, Ontario.
- Davies Ward Phillips & Vineberg, LLP. 2005. *Public-Private Partnerships*. Davies Ward Phillips & Vineberg LLP. Toronto, Ontario. (<http://www.dwp.com/en/1658.aspx>)
- De Alth, Shelley and Rueben, Kim. 2005. *Understanding Infrastructure Financing for California*. Public Policy Institute of California. San Francisco, California. (http://www.ppic.org/content/pubs/OP_605SAOP.pdf)
- De Corla-Souza, Patrick. 2005. *Financing Infrastructure Solutions: Pricing Strategies*. A power point presentation at the June 6-7, 2005 Freight Solutions Dialogue. Center for Clean Air Policy. Washington, DC. (<http://www.ccap.org/Presentations/DeCorla-Souza%20Day%202%20AM%20>)
- Deloitte & Touche. 2004. *Full Cost Accounting: From Better Understanding to Better Planning*. (<http://www.deloitte.com/dtt/newsletter/0,1012,sid%253D3666%252cid%253D47401,00.html>)
- Demers, Jacques and Kelsall, Brian. *Project Finance*. Ogilvy Renault LLP. Toronto, Ontario. (<http://www.lexpert.ca/directory/rd.php?area=P7>)

- Denton, Ben. 2005. *Funding Infrastructure: Wot Funding? Wot Infrastructure?* A power point presentation at the 2005 Planning Convention held in London, U.K. (<http://www.theplanningconvention.co.uk/downloads/bendenton.pdf>)
- Department of Infrastructure, Planning, and Natural Resources. 2004. *Funding Local Infrastructure*. Section 94 Contributions and Development Levies Taskforce of the Government of Australia. Canberra, ACT, Australia. (http://www.planning.nsw.gov.au/planning_reforms/p/taskforcereport_s94.pdf)
- Department of Transport and Regional Services. 2002. *Guidelines for a Local Government Infrastructure Financing Manual*. Government of Australia. Canberra, ACT, Australia. (http://www.dotars.gov.au/localgovt/publications/infrastructure_financing_manual/appendix_b.aspx)
- Devine, Theresa J. 2002. *Learning From Experience: A Primer on Tax Increment Financing*. IBO Fiscal Brief (September 2002). New York City Independent Budget Office. New York, New York. (www.ibo.nyc.ny.us)
- Diaz, Steven A.; Risetto, Christopher L.; and Withum, Mary F. 1997. "Privatization and Creative Funding Opportunities." *Best of the ABA Sections*. American Bar Association. Chicago, Illinois. (<http://www.abanet.org/genpractice/lawyer/bestof/fal97/risetto.htm>)
- Dicker, Todd J. and Kolo, Jerry. 1993. "Practical Issues in Adopting Local Impact Fees." *State and Local Government Review*. (Fall 1993). Vol. 25, No. 3. Carl Vinson Institute of Government and the Section on Intergovernmental Administration and Management (SIAM) of the American Society for Public Administration (ASPA). Athens, Georgia. (<http://www.stormwaterfinance.urbancenter.iupui.edu/PDFs/KoloDicker.pdf>)
- Diksit, Prabhat. 2005. *DOT Innovative Finance Strategies*. A power point presentation at the June 6-7, 2005 Freight Solutions Dialogue. Center for Clean Air Policy. Washington, DC. (<http://www.ccap.org/Presentations/Diksit%20Day%20%20Financing%20Infrastructure.pdf>)
- Dowall, David E. 2000. *California's Infrastructure Policy for the 21st Century: Issues and Opportunities*. Public Policy Institute of California. San Francisco, California. (<http://www.ppic.org/main/publication.asp?i=96>)
- Dowall, David E. 2001. "Rethinking Statewide Infrastructure Policies." *Public Works Management and Policy*. (July 2001). Vol. 6, No. 1. Sage Publications. (http://cpr.ca.gov/updates/archives/pdf/08_13_2004/supplemental/Dowall-Supplemental.pdf)
- Dowall, David E. 2003. *Making Room for the Future: Rebuilding California's Infrastructure*. Public Policy Institute of California. San Francisco, California. (<http://www.ppic.org/main/publication.asp?i=399>)
- Duncan Associates. 2000. *Infrastructure Financing Study: Financial Alternatives Memorandum*. Study prepared for the City of Lincoln, Nebraska. Lincoln, Nebraska. (<http://www.lincoln.ne.gov/city/pworks/ifsbground/pdf/revalt.pdf>)
- Efrat, Zilla. 1998. "State Spending Will Ensure Rapid Growth." *Sunday Times*. Johannesburg, South Africa. (<http://www.btimes.co.za/98/0426/survey/survey2.htm>)
- Elton, David and Vander Ploeg Casey G. 1994. *Red Ink II: Staying on Track or Derailing?* Canada West Foundation. Calgary, Alberta.
- Enoch, Marcus; Nijkamp, Peter; Potter, Steve; Ubbels, Barry; and Verhoef, Erik. 2000. "Alternative Ways of Funding Public Transport." *European Journal of Transport and Infrastructure Research*. Technische Universiteit Delft. Delft, The Netherlands. (http://ejtir.tudelft.nl/issues/2001_01/pdf/2001_01_05.pdf)
- E-plus Inc. 2005. *Municipal Leasing Home*. E-plus Inc. Herndon, Virginia. (<http://www.eplus.com/web/BaseRenderer.aspx?menuid=303>)
- Estache, Antonio (ed.). 1995. *Decentralizing Infrastructure: Advantages and Limitations*. World Bank Discussion Paper 290. The World Bank. Washington, DC. (<http://fasttrackonline.org/docs/R1132101.pdf>)
- Faber, Oscar. 2000. *Fair and Efficient Pricing in Transport: The Role of Charges and Taxes*. A report prepared for the European Commission. Brussels, Belgium. (<http://www.p2pays.org/ref/24/23955.pdf>)
- Falk, Nicholas. 2004. *Funding Sustainable Communities: Smart Growth and Intelligent Local Finance*. Town and Country Planning Association. London, UK. (http://www.urbed.com/cgbin/get_binary_doc_object.cgi?doc_id=224&frame=extra_pdf_1.pdf)
- Federal Highway Administration (FHWA) of the US Department of Transportation (USDOT). 2004. *Innovative Finance Primer*. FHWA Publication No. FHWA-AD-02-004. Washington, DC. (<http://www.fhwa.dot.gov/innovativefinance/ifp/ifprimer.pdf>)
- Federal Highway Administration (FHWA) of the US Department of Transportation (USDOT). 2005. *Partnerships in Transportation Workshops: Final Report*. Federal Highway Administration. Washington, DC. (<http://www.fhwa.dot.gov/ppp/061705wkshp.htm>)
- Federation of Canadian Municipalities (FCM). 2001. *Early Warning: Will Canadian Cities Compete?* Ottawa, Ontario.
- Field, Tom. 1992. *Municipal Infrastructure: Scope For Achieving Cost Efficiency/Effectiveness Through Technical Innovations*. Canada Mortgage and Housing Corporation (CMHC). Ottawa, Ontario.
- First Capital Equipment Leasing Corp. 2006. *Federal Government Leasing, State Government Leasing, and Municipal Leasing Programs*. First Capital Equipment Leasing Corp. East Sandwich, Massachusetts. (http://www.leaseexperts.com/GOVERNMENT_LEASING.htm)
- Flavelle, Dana and Wong, Tony. 2005. "Pension Funds Hail Investment Plan: Private Sector Would Build, Finance Infrastructure Projects." *Toronto Star*. May 12, 2005. Toronto, Ontario. (http://www.pensionsatwork.ca/english/pdfs/whats_new/0502/investplan.pdf)
- Fleishman, Dan. 2003. *Financing Infrastructure Improvements Through Impact Fees: A Manual for Main Municipalities on the Design and Calculation of Development Impact Fees*. Maine State Planning Office. State of Maine. Augusta, Maine. (<http://www.maine.gov/spo>)
- Fouzul Kabir Khan, M. 2004. *Sources of Financing Infrastructure Projects*. A presentation to the Regional Conference on the Universality of Infrastructure Services, held December 6-7, 2004, in New Delhi, India. (<http://teriin.org>)
- Georgia Transit Alliance. 2005. *The 2005 Legislative Agenda*. Georgia Transit Alliance. Norcross, Georgia. (<http://www.thegta.org/2005LegislativeAgenda.pdf>)
- Gibbins, Roger; Berdahl, Loleen; Vander Ploeg, Casey G. 2004. *Foundations for Prosperity: Creating a Sustainable Municipal-Provincial Partnership to Meet the Infrastructure Challenge of Alberta's 2nd Century*. Canada West Foundation. Calgary, Alberta.
- Gihring, Thomas A. and Smith, Jeffrey J. 2004. *Financing Transit Systems Through Value Capture: An Annotated Bibliography*. Victoria Transport Institute. Victoria, British Columbia. (<http://www.vtqi.org/smith.htm>)
- Goldsmith, Stephen. 1998. "Smaller Government Prescriptions for Big City Problems." *Fraser Forum*. (September 1998). Fraser Institute. Vancouver, British Columbia.
- Gore and Storrie. 1999. *Provision of Municipal Infrastructure Through Demand Management: Guidebook and Case Studies*. Canada Mortgage and Housing Corporation (CMHC). Ottawa, Ontario.
- Governor of California. 2005. "Budget Summary: Infrastructure." *The Governor's Budget: 2005-06*. State of California. Sacramento, California. (<http://www.ebudget.ca.gov/>)
- Green, Harry A.; Gros, Danielle; and Roehrich-Patrick, Lynnis. 2002. *Local Financing Techniques for Capital Projects*. Staff Research Brief (August 2002). Tennessee Advisory Commission on Intergovernmental Relations. State of Tennessee. Nashville, Tennessee. (<http://www.state.tn.us/tacir/PDF/FIELS/Infrastructure/InfraFinance.pdf>)
- Groot, Norman. 1995. "The Case for Market-Based Solutions to Environmental Problems." *Fraser Forum*. The Fraser Institute. Vancouver, British Columbia.
- Guerard, Rich. 2005. "Land Acquisition and Development Finance: Part Four." *Housing Zone Marketplace*. (<http://www.housingzone.com/article/CA6280335.html>)
- Gunaydin, Günsel H.; London, James B.; Peek, Jason M.; and Saltzman, Ellen W. 2001. *Transportation Needs and Funding Alternatives: A Survey*. Transportation Funding Series Special Report No. 1. The Jim Self Center on the Future at the Strom Thurmond Institute of Government & Public Affairs. Clemson, South Carolina. (<http://www.strom.clemson.edu/publications/london/transport.html>)
- Gunaydin, Günsel H.; London, James B.; Saltzman, Ellen W.; and Skinner, John C. 2003. *Transportation Funding Options for the State of South Carolina, 2003-2022*. Transportation Funding Series Special Report No. 3. The Jim Self Center on the Future at the Strom Thurmond Institute of Government & Public Affairs. Clemson, South Carolina. (<http://www.strom.clemson.edu/publications/london/transport.html>)
- Hall County. 2006. *Understanding SPLOST: Special Purpose Local Option Sales Tax*. Hall County, Georgia. (<http://www.hallcounty.org/gov/splost.asp>)
- Hallam, Greg. 2004. "Debt is not a Dirty Word When it Comes to Funding Infrastructure." *ONLINE Opinion: Australia's E-Journal of Social and Political Debate*. (<http://www.onlineopinion.com.au/view.asp?article=2293>)
- Harman, Tom. *Vote Yes on Proposition 53: A Commonsense Way to Provide Funding for California's Infrastructure*. (http://www.tomharmanassembly.com/op_ed_funding_infrastructure.htm)
- Hartzok, Alanna. 1997. "Pennsylvania's Success with Local Property Tax Reform: The Split-Rate Tax." *American Journal of Economics and Sociology*. Blackwell Publishing. Malden, Massachusetts. April 1997.

- Heller, Peter S. 2004. *Understanding Fiscal Space*. International Monetary Fund. Washington, DC. (<http://www.norad.no/default.asp?FILE=items/3036/108/Fiscal%20Space%20piece.DOC>)
- Heller, Peter. 2005. *Back to Basics—Fiscal Space: What It Is and How To Get It*. Finance and Development (June 2005). Vol. 42, No. 2. The International Monetary Fund. Washington, DC. (<http://www.imf.org/external/pubs/ft/fandd/2005/06/basics.htm>)
- Henkin, Tamar. 2002. *Financing Capital Investment: What are the Options and as Transit Agency Managers, How Do You Decide What's Right for You?* A power point presentation to the 3rd National Transportation Finance Conference held October 27, 2002 in Chicago, Illinois. (http://trb.org/conferences/Fin3/Workshop_Henkin_102702.ppt)
- Henning, Scott. 2006. "Educated Tax Cuts." *Let's Talk Taxes*. Canadian Taxpayers Federation. Edmonton, Alberta. (http://www.taxpayer.com/main/news.php?news_id=2142)
- Heyman, David. 2001. "Deal Struck for Fish Creek Bridge." *Calgary Herald*. July 27, 2001. Calgary, Alberta.
- Hillstrom Kevin and Hillstrom Laurie. 2006. *Advantages and Disadvantages of Leasing*. Thomson Gale and the Thomson Corporation. Farmington Hills, Michigan. (<http://www.referenceforbusiness.com/small/Inc-Mail/Leasing-Property.html>)
- Hofman Planning Associates. 2002. *How Can a Development Impact Fee Program Assist my City With Ensuring the Provision of an Adequate Infrastructure?* Carlsbad, California. (<http://www.hofmanplanning.com/expert/item.php?id=1>)
- Holle, Peter. 1996. "Enlightened Unionism." *Fraser Forum*. Fraser Institute. Vancouver, British Columbia.
- Holle, Peter. 1999. "Unicity Produced Poisonous Brew." *Winnipeg Free Press*. June 10, 1999. Winnipeg, Manitoba.
- Holle, Peter and Owens, Dennis. 2002. *Fixing Winnipeg's Downtown: Big-Picture Policy Changes to Revitalize the Inner City*. Policy Series No. 14. Frontier Centre for Public Policy. Winnipeg, Manitoba.
- Housing Industry Association. 2004. "The Hidden Infrastructure Challenge." *Housing Magazine*. April 2004. Housing Industry Association. Canberra, ACT, Australia. (http://housing.hia.asn.au/April04Edition/media/housing_affordability.pdf)
- HP Financial Services. 2004. *Benefits of Leasing*. Hewlett-Packard Development Company, L.P. Palo Alto, California. (http://www.hp.com/hpfinancialservices/ca/leasingbenefits_large.html)
- Industry Canada. 2001. *Public-Private Partnerships: A Canadian Guide*. Industry Canada. Ottawa, Ontario. (<http://www.strategis.ic.gc.ca/>)
- Infrastructure and PPP Section. 2003. *Policy Framework for Public Private Partnership (PPP) in Ireland: Evolution of PPP Policy in Ireland*. Department of the Environment, Heritage, and Local Government. Government of Ireland. Dublin, Ireland. ([http://www.environ.ie/DOE/DOEIPol.nsf/0/7d381a74476b3eff80256f0f003bc838/\\$FILE/Policy%20Framework%20Part%201.pdf](http://www.environ.ie/DOE/DOEIPol.nsf/0/7d381a74476b3eff80256f0f003bc838/$FILE/Policy%20Framework%20Part%201.pdf))
- Infrastructure Canada (Research and Analysis Branch). 2004. *Infrastructure Financing: A Literature Review of Financing Mechanisms*. Infrastructure Canada. Ottawa, Ontario. (http://www.infrastructure.gc.ca/research-recherche/rresul/rs/rs08_e.shtml)
- Infrastructure Financing Study Advisory Committee. 2001. *Infrastructure Financing Study: Advisory Committee Final Report*. City of Lincoln. Lincoln, Nebraska. (<http://www.lincoln.ne.gov/city/pworks/ifsbground/pdf/ifsrpt.pdf>)
- Infrastructure Subcommittee of the Action Committee on the Rural Economy (ACRE). 2004. *Certainty for Rural Saskatchewan*. Government of Saskatchewan. Regina, Saskatchewan. (<http://www.rdgov.sk.ca/acre/infrastructureReportNov2004.pdf>)
- Inland Transport Committee. 2003. *Financing Schemes of Transport Infrastructure: Public and Private Initiatives in Infrastructure Provision*. United Nations Economic Commission For Europe. New York, New York. (<http://www.unece.org/trans/doc/2003/wp5/TRANS-WP5-2003-16-info4e.pdf>)
- Institute for Saskatchewan Enterprise. 1990. *International Privatization: Global Trends, Policies, Processes, Experiences*. Institute for Saskatchewan Enterprise. Saskatoon, Saskatchewan.
- Interact Business Group. Municipal Lease Purchase Agreements: A Method of Funding for Public Safety Training Centers. Newport Beach, California. (http://www.theinteractgroup.com/municipal_lease.html)
- International Financial Services London. 2003. *Public Private Partnerships: UK Experience for International Markets*. International Financial Services London. London, UK. (http://www.ifs.org.uk/pdf_handler.cfm?file=PB_PPP_2002&CFID=95747&CFTOKEN=653696)
- International Project Finance Association (IPFA). 2005. *Introduction to Project Finance*. International Project Finance Association (IPFA). London, UK. (http://www.ipfa.org/about_pf.shtml)
- International Truck and Engine Corporation. 2006. *Municipal Lease*. Warrenville, Illinois. (<http://www.internationaldelivers.com/government/finance/municipallease.asp>)
- Irwin, Neal and Carpenter, Matt. 2005. *Funding and Financing of Transportation Infrastructure Policy Paper: Development of Policy Papers for Phase Two of the Transportation Master Plan for the City of Hamilton*. Hamilton, Ontario. (<http://www.myhamilton.ca/NR/rdonlyres/296369CR-117A-4673-BC5D-1129FA511B5F/016FundingandFinancingJan2005.pdf>)
- Jones, Jeffrey Neil. 1999. "A Turn of More Than the Century." *San Diego Earth Times Magazine*. San Diego, California. (<http://www.sdearthtimes.com/et1299/et1299s7.html>)
- Joyner, John E.; Steckler, Steve A.; and Wolf, Brian F. 2003. *Tapping Public Assets: Frequently Asked Questions About Selling or Leasing Infrastructure Assets*. Policy Study 303. Reason Foundation. Los Angeles, California. (<http://www.rppi.org/ps303.pdf>)
- Kammerer, Kelly. 1997. *Remarks to the International Governmental Financial Management Conference*. October 2, 1997, Arlington, Virginia. (http://www.usaid.gov/press/spe_test/speeches/1997/spch540.htm)
- Karlstrom, Urban. 2005. *Transport Infrastructure Investment: Funding Future Infrastructure Needs*. A power point presentation to the JTRC Committee held October 25-26, 2005. (<http://www.cemt.org/JTRC/working%20Groups/Infrastructure/T11projecstatus.pdf>)
- Karpova, Katia. *Financing Strategies for Infrastructure: Perspectives for Sound Development*. Institute for Public-Private Partnerships (IP3). Washington, DC. (http://www.ip3.org/pub/publication2002_005.htm)
- Kee, James Edwin and Forrer, John. 2002. *Private Finance Initiative: The Theory Behind the Practice*. A paper prepared for the 14th Annual Conference of the Association for Budgeting and Financial Management held October 10-12, 2002 in Kansas City, Missouri. (<http://www.unpan1.un.org/intradoc/groups/public/documents/aspa/unpan005912.pdf>)
- Kentucky Transportation Center College of Engineering. 2001. *Innovative Financing Options for Kentucky's Transportation Infrastructure*. University of Kentucky, Lexington, Kentucky. (http://www.ktc.uky.edu/report_abstracts/Recent/ktc_01_08.htm)
- Key Equipment Finance. 2006. *Leasing Benefits*. Key Equipment Finance Ltd. Superior, Colorado. (<http://www.kefonline.com/Capabilities/LeasingBenefits.asp>)
- Kitchen, Harry. 1993. *Efficient Delivery of Local Government Services*. Discussion Paper 93-15. School of Policy Studies, Queen's University. Kingston, Ontario.
- Kitchen, Harry. 2000. *Municipal Finance in a New Fiscal Environment*. CD Howe Commentary No. 147. CD Howe Institute. Toronto, Ontario.
- Kitchen, Harry. 2002(a). *Municipal Revenue and Expenditure Issues in Canada*. Canadian Taxpayer No. 107. Toronto, Ontario.
- Kitchen, Harry. 2002(b). *Financing Municipal Infrastructure in Ontario*. Universal Workers Union. Toronto, Ontario.
- Kitchen, Harry. 2003. *Physical Infrastructure and Financing*. A research paper prepared for the Panel on the Role of Government in Ontario. Trent University. Peterborough, Ontario. (<http://www.trentu.ca/economics/WorkingPapers/Physical%20Infrastructure.pdf>)
- Kitchen, Harry. 2004. "You Can't Build a City on Handouts." *Globe and Mail*. August 21, 2004. Toronto, Ontario. (<http://www.aims.ca/aimslibrary.asp?ft=4&id=1015>)
- Kitchen, Harry and Slack, Enid. 1993. *Business Property Taxation*. Discussion Paper 93-24. School of Policy Studies, Queen's University. Kingston, Ontario.
- Kozluk, Tomasz; Mehrotra, Aaron; and Valila, Timo. 2005. *Roads on a Downhill? Trends in EU Infrastructure Investment*. EIB Papers. Vol. 10, No. 1. European Investment Bank. Luxembourg. (http://www.eib.org/Attachments/efs/eibpapers/y05n1v10/01_Valila_Kozluk_Mehrotra.pdf)
- Lampert, Greg. 2000. *Restoring the Balance: Financing Municipal Infrastructure Required for New Development*. A report prepared for the Canadian Home Builders' Association. Ottawa, Ontario. (<http://www.chba.ca/membersarea/policies/PDFS/restoringthebalance.pdf>)

- Land Transport Authority (LTA). 1996. *White Paper: A World Class Land Transport System*. Ministry of Transport, Government of Singapore. Singapore. (http://www.mot.gov.sg/white_paper.html)
- Land Use Research Foundation of Hawaii. 2004. *Report From the Working Group on Creative Financing for Infrastructure*. Honolulu, Hawaii. (<http://www.hcdch.state.hi.us/infrastructure-final-report.pdf>)
- Leahy, Mike. 2005. *Operating the Toll Roads: A National Perspective*. A power point presentation of the Chief Toll Operations Officer of the Transportation Corridor Agencies (TCA) of California. (http://www.tcagencies.com/home/images/innovation_perspective.pdf)
- Leasing Professional. *Tales of TIFs and PILOTs: Would You Know a Tax if You Saw One?* (<http://www.leasingprofessional.com/lease-agreement-strategy/310-strategies-for-real-estate-taxes.htm>)
- Lenard, Dennis and Ong, Han C. 2002. *Can Private Finance be Applied in the Provision of Housing?* Paper presented to an International Congress held on April 19-26, 2002 in Washington, DC. (http://www.fig.net/pub/fig_2002/TS10-1/TS10_1_ong_lenard.pdf)
- Leslie, Keith. 2005. "For Sale: Ontario Roads, Transit." *Canadian Press (CP)*. Toronto, Ontario. (<http://www.list.web.net/archives/getsmart-/2005/000342.html>)
- Levinson, David M. 2000. *Financing Infrastructure Over Time*. Department of Civil Engineering, University of Minnesota. Minneapolis, Minnesota. (<http://www.ce.umn.edu/~levinson/Papers/Financing/Infrastructure.pdf>)
- Lloyd, Jim. 2005. *The Future of Transport Infrastructure Funding and Auslink*. An address to the Western Australia section of the Chartered Institute of Logistics and Transport, July 29, 2005, in Perth, WA, Australia. (http://www.ministers.dotars.gov.au/jil/speeches/2005/LS07_2005.htm)
- Loreto, Richard A. and Price, Trevor (eds). 1990. *Urban Policy Issues: Canadian Perspectives*. McClelland and Stewart Inc. Toronto, Ontario.
- Love, Jean and Cox, Wendell. 1991. *False Dreams and Broken Promises*. Policy Analysis No. 162. The Cato Institute. Washington, DC.
- Lowndes County. 2002. *Lowndes County SPLOST*. Lowndes County, Georgia. (<http://www.lowndescounty.com/splost.asp>)
- Luciani, Patrick. 1996. *Economic Myths: Making Sense of Canadian Policy Issues*. (2nd edition.) Addison-Wesley Publishers Ltd. Don Mills, Ontario.
- Lynch, David. 1996. *Financing Private Infrastructure Projects: Australian Investment Bankers' Experience*. A briefing paper prepared for the APEC Financier's Meeting held February 1996 in Tokyo, Japan. (<http://www.apec.org.au/docs/iss8.htm>)
- Lyons, Shane. 2005. "Public Private Partnerships (PPPs) in Ireland." *Inside Government*. Price Waterhouse Coopers Corporate Finance. Dublin, Ireland. (<http://www.pwcglobal.com/Extweb/service.nsf/docid/851F384BAC906A7680256FEA002FF720>)
- M&T Bank. 2006. *Tax Exempt Municipal Lease Financing*. M&T Bank. Buffalo, New York. (http://services.mandbank.com/government/fin_cred_TEMPLF.pdf)
- MacDonald, Michael. 2002. "The Bucks Should Stop Here." *Globe and Mail*. January 10, 2002. Toronto, Ontario.
- Madris, Richard and Shockey, George. 2005. "Infrastructure Funds: Bridging the Global Infrastructure Funding Gap." *Stroock Client Memorandum*. Stroock & Stroock & Lavan, LLP. New York, New York. (<http://www.stroock.com/SiteFiles/Pub384.pdf>)
- Manahan, Andy. 2004. *Submission on the Infrastructure Funding Gap*. Universal Workers Union Local #183. Toronto, Ontario. (<http://www.local183.ca/index.cfm?PID=14321&PIDList=14174,14321>)
- Manitoba Heavy Construction Association. 1998(a). *Strategic Infrastructure Reinvestment Policy (SIRP): Executive Summary*. (http://www.mhca.mb.ca/Infrastructure/heavy_constr_sirprf.html)
- Manitoba Heavy Construction Association. 1998(b). *A National Infrastructure Policy (NIP): A Sustained Commitment*. Winnipeg, Manitoba. (http://www.mhca.mb.ca/infrastructure/heavy_constr_nipbrief.html)
- Marshall Macklin Monaghan Ltd. 1992. *Achieving Infrastructure Cost Efficiency/Effectiveness Through Alternative Planning Approaches*. Canada Mortgage and Housing Corporation (CMHC). Ottawa, Ontario.
- Martin, Kathryn. 2004. *PPP and Road User Charging: Roads in Australia and New Zealand and Freight Management in Western Australia*. A power point presentation to the World Road Association (PIARC) in Kananaskis, Alberta, December 2004. (<http://www.cnc-piarc-ipcr.ca/documents/AustraliaPPP.pdf>)
- Mattoon, Richard. 2002. "Maintaining and Financing Infrastructure in Tough Budgetary Times." *Chicago Fed Letter*. Number 184c. The Federal Reserve Bank of Chicago. Chicago, Illinois. (http://www.chicagofed.org/publications/fedletter/2002/cf1dec2002_184c.pdf)
- McCready, Douglas J. 1984. *The Canadian Public Sector*. Butterworth and Company. Toronto, Ontario.
- McFarlane, Susan and Roach, Robert. 1999. *Great Expectations: The Ideal Characteristics of Nonprofits*. Canada West Foundation. Calgary, Alberta.
- McGoun, Micheal; O'Brien, Kevin; Robey, Claudette; Salak, Rebecca; and Storey, John. 2004. *Funding Options for Emerging Public Works Infrastructure Investments in Cuyahoga County*. A report prepared for Build Up Greater Cleveland. Cleveland State University. Cleveland, Ohio. (<http://urban.csuohio.edu>)
- Ministry of Municipal Affairs, British Columbia. 1999. *Public Private Partnership: A Guide for Local Government*. Government of British Columbia. Victoria, British Columbia. (http://www.llbc.leg.bc.ca/Public/PubDocs/bcdocs/329340/pol_research.pdf)
- Ministry of Public Infrastructure Renewal, Government of Ontario. 2004. *New Infrastructure Framework: Financing Strategies*. Background Document. Government of Ontario. Toronto, Ontario. (http://www.pir.gov.on.ca/userfiles/HTML/cma_4_35846_1.html)
- Mintz, Jack. 2002. "Why Tax-Exempt Municipal Bond Financing is Bad Policy." *National Post*. May 14, 2002.
- Mintz, Jack and Preston, Ross S. (eds). 1993. *Capital Budgeting in the Public Sector*. John Deutsch Institute for the Study of Economic Policy. Queen's University. Kingston, Ontario.
- Mirza, Saeed M. and Haider, Murtaza. 2003. *The State of Infrastructure in Canada: Implications for Infrastructure Planning and Policy*. Department of Civil Engineering at McGill University. Montreal, QC.
- Moody, Mitch and Nelson, Arthur C. 2003. *Paying for Prosperity: Impact Fees and Job Growth*. A Discussion Paper prepared for the Brookings Institution Center on Urban and Metropolitan Policy. Brookings Institution. Washington, DC. (<http://www.brookings.edu/metro/publications/nelsonimpactfees.htm>)
- Morris, Reed F. 2001. *Completing Transportation Projects: Innovative Transportation Financing in the 21st Century*. National Conference of State Legislatures. Washington, DC. (<http://www.ncsl.org/programs/transportation/tranfinan01.htm>)
- Mulcahy, Ed. 2005. *Public/Private Partnerships Needed to Ease Infrastructure Funding Pain*. Engineering Inc. American Council of Engineering Companies. Washington, DC. (<http://www.acec.org/publications/sept-oct05/fromacec.pdf>)
- Musil, Thomas A. *Development Impact Fees and Exactions: Evaluating Real Estate Developer Negotiation Strategies in the Determination and Settlement of Capital Facilities Charges and Community/Environmental Costs*. Shenehon Center for Real Estate Education. College of Business at the University of St. Thomas. Minneapolis, Minnesota. (<http://www.naioop.org/developmentmag/development/impactfees.pdf>)
- National Association of Home Builders (NAHB). 2003. "Flaws in Brookings Impact Fee Report Cited." *The Nation's Building News*. (The official online weekly newspaper of the NAHB). Washington, DC. (<http://www.nbnews.com/NBN/textonly/2003-08-11/Smart+Growth/index.html>)
- National Association of Home Builders (NAHB). 2005. "State Infrastructure Finance Alternatives Examined." *The Nation's Building News*. (The official online weekly newspaper of the NAHB). Washington, DC. (<http://www.nbnews.com/NBN/issues/2005-10-3/Politics+&+Government>)
- National Conference of State Legislatures. 1999. *The Appropriate Role of User Charges in State and Local Finance*. Washington, DC. (<http://www.ncsl.org/programs/fiscal/fpumain.htm>)
- National Guide to Sustainable Municipal Infrastructure 2002. *Alternative Funding Mechanisms: A Best Practice by the National Guide to Sustainable Municipal Infrastructure*. Ottawa, Ontario. (<http://www.infraguide.ca>)
- NOLO. 2005. *Buying vs. Leasing Business Equipment*. NOLO Legal Encyclopedia. Berkeley, California. (<http://www.nolo.com>)
- Oakerson, Ronald J. 1999. *Governing Local Public Economies*. Institute for Contemporary Studies. Oakland, California.
- OECD Secretariat. 2005. *A Policy Framework for Investment: Infrastructure and Financial Services*. Background information in support of the Global Forum on International Investment held on October 25-27, 2005, in Rio de Janeiro, Brazil. The Organisation for Economic Cooperation and Development. Paris, France. (<http://www.oecd.org/dataoecd/11/40/35489746.pdf>)
- Open Republic Institute. 2005. "Public-Private Partnerships: Public Interest vs. Corporate Welfare." *Policy Watch* (January 14, 2005). Open Republic Institute. Dublin, Ireland. (http://www.openrepublic.org/policy_watch/20050114.htm#h1a)
- Palda, Filip. 1998. *Home on the Urban Range: An Idea Map for Reforming the City*. The Fraser Institute. Vancouver, British Columbia.

- Pangestu, Pingki Elka. 1997. *Mobilizing Financial Resources for Urban Infrastructure*. Conference paper delivered at the 2nd International Expert Panel Meeting on Urban Infrastructure Development, December 8-9, 1997 in Bangkok, Thailand. (<http://www.blpnet.org/learning/casebooks/uncrd/pangestu.pdf>)
- Parker, Zane. 2005. *The Emerging Role of Fiscal Policy: Implementing Tax Shifting in Municipalities*. A power point presentation to the April 19-22, 2005 Conference of the Planning Institute of British Columbia (PBIC) held in Victoria, British Columbia. (<http://www.pibc.bc.ca/05conf/Images2/zane%20parker.ppt>)
- Parkin Michael and Bade Robin. 1997. *Economics: Canada in the Global Environment*. Addison-Wesley Publishers Ltd. Toronto, Ontario.
- Parsons, Graham. 1994. *Public Services: New Approaches and Directions*. Canada West Foundation. Calgary, Alberta.
- Pawlukiewicz, Michael. 2005. *Financing Urban Infrastructure*. An Urban Land Institute Forum Report on proceedings of a conference held April 7-8, 2005 in Washington, DC. (<http://www.uli.org/AM/template.cfm?Section=Home&CONTENTID=33155&TEMPLATE=/cm/ContentDisplay.cfm>)
- Penoff, David. 2001. "Financial Management: Lease Purchase Agreements Offer Flexibility." *American City and County*. Primedia Business Magazines and Media Inc. Pearl River, New York. (http://www.americacityandcounty.com/mag/government_financial_management_leasepurchase/)
- Peters, Mary. 2004. *A Bigger Role for the Private Sector*. Remarks of the Federal Highway Administrator to the Partnerships in Transportation Conference sponsored by the National Council for Public-Private Partnerships (NCPPT) in Orlando, Florida on October 6, 2004. Federal Highway Administration (FHWA) of the US Department of Transportation (USDOT). Washington, DC. (<http://www.fhwa.dot.gov/pressroom/re041006.htm>)
- Pirie, Madsen. 1987. *The Principles and Practice of Privatization*. Fraser Forum. May 1987. Fraser Institute. Vancouver, British Columbia.
- Platt, Michael. 2006. *The Calgary Sun*. April 11, 2006. Calgary, Alberta.
- Poisson, Yves. 2002. *Public Infrastructure in Canada. Status, Priorities, and Planning*. Public Policy Forum. Ottawa, Ontario.
- Poschmann, Finn. 2003. *Private Means to Public Ends: The Future of Public-Private Partnerships*. CD Howe Commentary. No. 183. June, 2003. CD Howe Institute. Toronto, Ontario.
- Pozdena, Randall J. 2002. *The Crucial Role of Pricing in the Reform of Road Finance*. A power point presentation of the ECONorthwest to the Washington State Department of Transportation. Olympia, Washington. (<http://www.wsdot.wa.gov/partners/tifa/0730pozdena.pdf>)
- Price Waterhouse Coopers. *The PPP and Infrastructure Market in Canada*. Price Waterhouse Coopers. Toronto, Ontario. (http://www.pwcglobal.com/uk/eng/about/svcs/pfp/pwc_PFI-article.pdf)
- Price Waterhouse. 1996. *Financing Options for Regional Infrastructure in Western Australia*. Paper prepared for the Western Australian Technology and Industry Advisory Council (TIAC). Bentley, WA, Australia. (<http://www.wa.gov.au/tiac/finregion/finreg2.pdf>)
- Proficom Financial. 2006. *Benefits of Leasing*. Concord, Ontario. (<http://www.proficom.ca/benefitsofleasing.asp>)
- Public Policy Institute of California (PPIC). 1997. *Development Fees and New Homes: Paying the Price in California*. A Research Brief of the PPIC. San Francisco, California. (http://www.sactaqc.org/Resources/Literature/Economic_Vitality/PPIC_Devt_Fees.pdf)
- Public Policy Institute of California (PPIC). 2005. *Financing Infrastructure: A PPIC Fact Sheet*. San Francisco, California. (http://www.ppic.org/content/pubs/JTF_FinancingInfrastructureJTF.pdf)
- Public Works Department of the City of Winnipeg. 2001. *Financing Infrastructure Preservation: Challenges and Opportunities*. City of Winnipeg. Winnipeg, Manitoba. (http://www.winnipeg.ca/publicworks/DepartmentalReports/pdf/Financing_Infrastructure_Preservation.pdf)
- Puget Sound Regional Council. 2002. *The Case for Examining Value Pricing*. Seattle, Washington. (<http://www.psrc.org/projects/pricing/pricepaper.pdf>)
- Rao, Narendar V. 2004. "A Note on the Financing of Infrastructure Projects." *Journal of Business and Public Affairs*. (<http://www.murraystate.edu/cbpa/journal/04Fall/04Rao.pdf>)
- Richardson, Pearl. 1983. *Trends in Municipal Leasing. A report prepared for the Subcommittee on Oversight and the Committee on Ways and Means, US House of Representatives*. Washington, DC. (<http://www.cbo.gov/showdoc.cfm?index=5077&sequence=0>)
- Rossiter, Ann and Startup, Tom. 2003. *The Role of Property in Financing Infrastructure*. Social Market Foundation. London, UK. (<http://www.bpf.org.uk/files/resdoc109846522723-1.pdf>)
- Rural Community Assistance Corporation. 1999. *Infrastructure Financing for Small Communities in Washington State*. Washington State Department of Community, Trade, and Economic Development. Olympia, Washington. (<http://www.brei.org/resources/WAbooks.pdf>)
- RV Anderson Associates Ltd. 2002. *Ahead of the Wave: A Guide to Sustainable Asset Management for Canadian Municipalities*. Toronto, Ontario.
- Samuel, Peter. 2004. *The Toll Road News*. (October 15, 2004). Fredrick, Maryland. (<http://www.tollroadnews.com>)
- Saskatchewan Urban Municipalities Association (SUMA). 1995. *Task Force on Urban Government Renewal*. Regina, Saskatchewan.
- Schmidt, Robert. 2000. *Financing Regional Infrastructure*. National Association of Industrial and Office Properties Research Foundation. Herndon, Virginia. (<http://www.naiop.org/membersarea/research/infrastructure.pdf>)
- Seidle, Leslie F. (ed.). 1993. *Rethinking Government: Reform or Reinvention*. Institute for Research on Public Policy (IRPP). Montreal, Quebec.
- Shane, Jeffrey N. 2005. *Transportation Infrastructure and the Private Sector*. Remarks of the Under Secretary for Policy of the US Department of Transportation to the 46th Annual Forum of the Transportation Research Forum held in Washington, DC on March 7, 2005. US Department of Transportation (USDOT). Washington, DC. (<http://www.dot.gov/affairs/shanesp030705.htm>)
- Shaoul, Jean. 2004. *Britain: Labour's Privatization of Roads*. International Committee of the Fourth International (ICFI). Sheffield, UK. (<http://www.wsws.org/articles/2004/jul2004/road-j22.shtml>)
- Sheil, Christopher. 2004. *This Really is Populism*. The Back Pages. (<http://www.backpagesblog.com/weblog/archives/000279.html>)
- Skelsey, Mark. 2004. "\$50,000 Penalty on New Homes." *Sydney Daily Telegraph*. April 23, 2004. Sydney, NSW, Australia. (http://www.arch.usyd.edu.au/web/research/centres_prc.html#1)
- Slack, Enid. 1996. *Financing Infrastructure: Evaluation of Existing Research and Information Gaps*. Canada Mortgage and Housing Corporation (CMHC). Ottawa, Ontario.
- Slack, Enid. 2002(a). *Financing Smart Growth in the Region of Waterloo: A Discussion Paper*. A paper presented for the Waterloo Region in the 21st Century: Planning Our Future, Volume 3, Technical Reports. Waterloo, Ontario. ([http://www.region.waterloo.on.ca/web/region.nsf/o/C574A7593C23C6385256C8E005B7B7E/\\$file/v3_6.PDF?openement](http://www.region.waterloo.on.ca/web/region.nsf/o/C574A7593C23C6385256C8E005B7B7E/$file/v3_6.PDF?openement))
- Slack, Enid. 2002(b). *Municipal Finance and the Pattern of Urban Growth*. CD Howe Institute Commentary No. 160. CD Howe Institute. Toronto, Ontario. (http://www.urbancenter.utoront.ca/pdfs/elibrary/Slack_Mun-Finance-Urb-Growth.pdf)
- Smith, Blake. 2003. *Building for Tomorrow: Innovative Infrastructure Solutions*. National Association of Homebuilders (NAHB). Washington, DC. (http://www.nahb.org/publication_details.aspx?sectionID=634&publicationID=861)
- Smith, Blake. 2005. *Infrastructure Finance: Does Your State Innovate?* National Association of Homebuilders (NAHB). Washington, DC. (http://www.nahb.org/publication_details.aspx?sectionID=634&publicationID=2470)
- Smith, Dean. 1996. "World Champions of Property Tax." *The Taxpayer*. Vol. 8, No. 5. Canadian Taxpayers Federation. Regina, Saskatchewan.
- Smith, Stewart. 2004. *A Parliamentary Briefing Paper on Infrastructure*. Parliament of New South Wales. Sydney, NSW, Australia. (<http://www.parliament.nsw.gov.au/prod/parliament/publications.nsf/0/C638>)
- South Carolina Association of Counties. 2000. *Local Sales and Use Taxes*. Columbia, South Carolina. (http://www.sccounties.org/Assoc_Groups/scatt/LOST2.htm)
- South Carolina Department of Revenue. 2004. *Sales and Use Tax Rates by County*. State of South Carolina. Columbia, South Carolina. (<http://www.sctax.org>)
- South Florida Regional Planning Council. 2005. *Funding the Future: The Case for a Dedicated Funding Source for Transportation*. South Florida Regional Planning Council. Hollywood, Florida. (<http://www.sfrpc.com/ftp/pub/srpp/fundingthefuture.pdf>)
- Spitzer, Hugh. 2002. *Alternative Approaches to Financing Transportation Infrastructure*. A presentation of Foster, Pepper & Shefelman, PLLC, to the Washington State Department of Transportation on July 30, 2002. Olympia, Washington. (<http://www.wsdot.wa.gov/partners/tifa/0730spitzer.pdf>)
- Sprague, Bradford. 2002. "Tax Increment Financing." *Ohio Investor*. Center for Public Investment Management. Ohio Treasurer of State. Columbus, Ohio. (<http://www.cpimohio.org/newsletter/mayjune/tif.htm>)
- Stratos Inc. 2003. "Overcoming The Barriers to Economic Instruments." Chapter 4 in *Economic Instruments for Environmental Protection and Conservation: Lessons for Canada*. Prepared for the External Advisory Committee on Smart Regulation. Government of Canada. Ottawa, Ontario. (<http://www.pco-bcp.gc.ca/smartreg-regint/en/06/01/su-11d.html>)

- Suresh, V. 2004. *Innovative Infrastructure Financing*. A power point presentation by the Director General of Good Governance and the Former Chairman and Managing Director of HUDCO. New Delhi, India. (<http://iif.edu/data/iif/innews/V%20Suresh%205%20M%20arch%202004.ppt>)
- Szabo, Ferenc. 1999. *Public-Private Partnerships in Hungarian Motorways' Construction*. A paper delivered to the Seminar on Public-Private Partnerships (PPPs) in Transport Infrastructure Financing held in Paris, France on January 12, 1999. (<http://www.cemt.org/online/ppp99/Szabo.pdf>)
- Tanner, Lindsay. 2005. "Infrastructure: The New Hot Topic." *ONLINE Opinion: Australia's E-Journal of Social and Political Debate*. (<http://www.onlineopinion.com.au/view.asp?article=3638>)
- Team Equipment Leasing. 2006. *Benefits to the Lessee of Using Municipal Lease Purchase*. Team Equipment Leasing. Austin, Texas. (<http://www.teamleasing.com>)
- Thomas, Robert Paul. 1981. *Microeconomic Applications: Understanding the American Economy*. Wadsworth Publishing Company. Belmont, California.
- Tischler and Associates. 1998. *Reconnaissance of Utility Fees and Policies*. A report prepared for the City of Stillwater. Stillwater, Oklahoma. (<http://www.stillwater.org/extras/tischler/utlirecon.htm>)
- Tomalty, Ray. 2000. *A Lost Opportunity to Encourage Sustainable Urban Development*. New Urban Agenda. Toronto, Ontario. (<http://www.peck.ca/naa/ies/ies/02.htm>)
- Toronto Board of Trade. 2004. *Response to The Ministry of Public Infrastructure Renewal's Building a Better Tomorrow Discussion Paper*. Toronto Board of Trade. Toronto, Ontario. (http://www.bot.com/assets/StateAssets/Documents/PDF/Policy/2004_Municipal/April2004_MPIRDiscussionPaper_final.pdf)
- Toronto Finance Committee. 2000. *Issuance of Tax-Exempt Municipal Debentures*. City of Toronto. Toronto, Ontario.
- Treasury Department of New South Wales. 2001. *Working With Government: Policy for Privately Financed Projects*. Government of New South Wales. Sydney, NSW, Australia. (<http://www.treasury.nsw.gov.au/wwg/pdf/wwgpolicy.pdf>)
- Trebilcock, Michael J. 1994. *The Prospects for Reinventing Government*. CD Howe Institute. Toronto, Ontario.
- Trends in Municipal Leasing*. 1983. Report prepared for the Subcommittee on Oversight of the Committee on Ways and Means of the US House of Representatives. Washington, DC. (<http://www.cbo.gov/showdoc.cfm?index=5077&sequence=0>)
- Tuck, Simon and Bloom, Richard. 2003. "RRSP Limit to Rise Over Next Four Years." *Globe and Mail*. February 19, 2003. Toronto, Ontario.
- Tullock, Gordon. 1994. *The New Federalist*. The Fraser Institute. Vancouver, British Columbia.
- Union of British Columbia Municipalities (UBCM). 1993. *Local Government Transfer System: Options for Reform*. Richmond, British Columbia.
- Union of Nova Scotia Municipalities (UNSM). 2001. *Municipal-Provincial Roles and Responsibilities Review: Literature Review*. Halifax, Nova Scotia. (<http://www.unsm.ca>)
- United Nations Secretariat. 1995. *The Role of Public Administration in Developing Infrastructure and Protecting the Environment*. Report of the 12th Meeting of Experts on the United Nations Programme in Public Administration and Finance, July, 1995. New York, New York. (<http://www/1un.org/intradoc/groups/public/documents/un/unpan000778.pdf>)
- United States General Accounting Office (GAO). 1995. *Private Pension Plans: Efforts to Encourage Infrastructure Investment*. A Report to the Committee on Transportation and Infrastructure, House of Representatives. Washington, DC. (<http://www.gao.gov/archive/1995/he95173.pdf>)
- Vander Ploeg, Casey G. 2002(a). *Framing a Fiscal Fix-Up: Options for Strengthening the Finances of Western Canada's Big Cities*. Canada West Foundation. Calgary, Alberta.
- Vander Ploeg, Casey G. 2002(b). *Big City Revenue Sources: A Canada-US Comparison of Municipal Tax Tools and Revenue Levers*. Canada West Foundation. Calgary, Alberta.
- Vander Ploeg, Casey G. 2003. *A Capital Question: Infrastructure in Western Canada's Big Six*. Canada West Foundation. Calgary, Alberta.
- Vander Ploeg, Casey G. 2004(a). *No Time to be Timid: Addressing Infrastructure Deficits in the Western Big Six*. Canada West Foundation. Calgary, Alberta.
- Vander Ploeg, Casey G. 2004(b). *Straight Talk: Property Taxes in Western Canada's Big Six*. Canada West Foundation. Calgary, Alberta.
- Vander Ploeg, Casey G. 2005. *Rationale for Renewal: The Imperatives Behind a New Big City-Provincial Partnership*. Canada West Foundation. Calgary, Alberta.
- Vanier, D.J. 2000. *Advanced Asset Management: Tools and Techniques*. Presentation to the APWA International Public Works Congress and NRCC/CPWA Seminar Series Innovations in Urban Infrastructure. (<http://irc.nrc-cnrc.gc.ca/uir/apwa/apwa00/>)
- Vanier, D.J. 2001. *Asset Management: A to Z*. Presentation to the APWA International Public Works Congress in Philadelphia. September 2001.
- Varma, Munish R. 2005. *International Financial Markets and Infrastructure Financing Tools*. A power point presentation at the Deutsche Bank in September 2005. (<http://www.fpo.go.th/pdf/Munish%20R%20VARMA%20-%20Presentation%20%5B2%5D.ppt>)
- Vickerman, Roger. 2002. *Private Financing of Transport Infrastructure: Some UK Experience*. Centre for European, Regional and Transport Economics, the University of Kent. Canterbury, UK. (http://www.wip.tu-berlin.de/workshop/2002/papers/tu-berlin_wip_workshop_2002-paper_vickerman-private_financing_transport_infrastructure.pdf)
- Victoria Transport Policy Institute. 2005. *Smart Growth Policy Reforms: Changing Planning, Regulatory, and Fiscal Practices to Support More Efficient Land Use*. Victoria Transport Policy Institute. Victoria, British Columbia. (http://www.tranbbs.net/vtppi/tdm/tdm95.htm#_Toc75668393)
- Volpe Center, US Department of Transportation. 2005. *Development and Its Traffic Impacts: Policy Tools for Baltimore City*. A report prepared for the Baltimore City Department of Transportation. Baltimore, Maryland. (<http://www.ci.baltimore.md.us/SEStudy/PolicyTools.pdf>)
- Walker, Michael. 1988. *Privatization: Tactics and Techniques*. The Fraser Institute. Vancouver, British Columbia.
- Washwani, Molly. *Mello Roos Meets Rodeo Drive*. Media release from Stone & Youngberg LLC. Los Angeles, California. (<http://www.buybonds.com/aboutus/release.asp?id=89>)
- Wassmansdorf, David. 2005. *Reurbanization: Making it Happen*. Presentation to the Canadian Homebuilders' Association 2005 Reurbanization Conference, held in Kitchener, Ontario on June 22, 2005. ([http://www.region.waterloo.on.ca/web1region/nsf/o/12D38CB5C00299C585256FE0004FA019/\\$File/waassmansdorf.pdf?OpenElement](http://www.region.waterloo.on.ca/web1region/nsf/o/12D38CB5C00299C585256FE0004FA019/$File/waassmansdorf.pdf?OpenElement))
- Water Partnership Council. 2005. *An Evaluation of Public-Private Partnerships for Water and Wastewater Systems*. Water Partnership Council. Washington, DC. (<http://www.waterpartnership.org/PDF/IndustrySurvey2005.pdf>)
- Wei, Hong. 2001. *Private Sector Finance for Infrastructure*. Asian Development Bank. Manila, Philippines. (<http://www.chinawest.gov.cn/english/rzh/11f.htm>)
- West Central Initiative. 2003. *Infrastructure Study for West Central Minnesota Communities*. West Central Initiative. Fergus Falls, Minnesota. (<http://www.wcif.org/publications/infrastructurestudy.shtml>)
- Western Provincial Transportation Ministers Council. 2005. *Western Canada Transportation Infrastructure Strategy for an Economic Network*. (http://www.th.gov.bc.ca/publications/reports_and_studies/WTM_Final_March%202005.pdf)
- West Virginia Municipal League. 2006. *WVML Leasing Program*. West Virginia Municipal League. Charleston, West Virginia. (<http://www.wvml.org/members/leasing.htm>)
- Wikipedia. 2006. *Special Purpose Local Option Sales Tax*. Wikipedia.org. (<http://en.wikipedia.org/wiki/SPLOST>)
- Women's Economic Self-Sufficiency Team. 1997. *The Basics of Leasing*. Albuquerque, New Mexico. (An article uploaded to the US Small Business Administration website.) (http://www.sba.gov/test/wbc/docs/finance/lease_basics.html)
- Woodruff, Cathy. 2005. "Want a Bridge? State has Plenty." *Times Union*. Albany, New York. (<http://timesunion.com/AspStories/story.asp?storyID=326829&category=CAPITOL&BCCCode=HOME&newsdate=1/26/2005>)
- Yates, Athol. 2002. *Public Investment in Infrastructure: Justified and Effective*. A Discussion Paper. Institution of Engineers of Australia. Barton, ACT, Australia. (<http://www.ieaust.org.au/policy/res/downloads/publications/InfraSpending.doc>)
- Zeemac Vehicle Lease Ltd. 2004. *Benefits of Leasing*. Zeemac Vehicle Lease Ltd. Burnaby, British Columbia. (http://www.zeemac.com/mainpages/Lease%20Submenu/leasesub_2.html)
- ZVEI. 2005. *The Road Ahead for Europe-wide Traffic Information Systems*. A Keynote Speech at the 5th European Congress and Exhibition on Intelligent Transport Systems. Hanover, Germany. (http://www.zvei.org/fileadmin/user_upload/Fachverbundene/Elektrobahnen/ITS-Hannover2005_keynoteEK.pdf)

About the Canada West Foundation

Our Vision

A dynamic and prosperous West in a strong Canada.

Our Mission

A leading source of strategic insight, conducting and communicating non-partisan economic and public policy research of importance to the four western provinces, the territories, and all Canadians.

Canada West Foundation is a registered Canadian charitable organization incorporated under federal charter (#11882 8698 RR 0001).

In 1970, the One Prairie Province Conference was held in Lethbridge, Alberta. Sponsored by the University of Lethbridge and the Lethbridge Herald, the conference received considerable attention from concerned citizens and community leaders. The consensus at the time was that research on the West (including BC and the Canadian North) should be expanded by a new organization. To fill this need, the Canada West Foundation was created under letters patent on December 31, 1970. Since that time, the Canada West Foundation has established itself as one of Canada's premier research institutes. Non-partisan, accessible research and active citizen engagement are hallmarks of the Foundation's past, present and future endeavours. These efforts are rooted in the belief that a strong West makes for a strong Canada.

More information can be found at www.cwf.ca.



#900, 1202 Centre Street SE
Calgary, Alberta, Canada T2G 5A5
Telephone: 403.264.9535

www.cwf.ca