



Studies in Economic Prosperity

FRASER
INSTITUTE

May 2013

Using Public-Private Partnerships to Improve Transportation Infrastructure in Canada

by Charles Lammam,
Hugh MacIntyre,
and Joseph Berechman

Contents

Executive summary / iii

Introduction / 1

1 What are Public-Private Partnerships? / 3

2 The benefits of Public-Private Partnerships / 11

3 Common concerns about Public-Private Partnerships / 23

4 Conditions for successful Public-Private Partnerships / 31

5 Measuring the extent of transportation Public-Private Partnerships in Canada / 37

Conclusion / 44

Appendix A: Information on individual Canadian transportation P3s
from 1985 to 2013 (as of Jan. 30) / 47

Appendix B: A description of PWF's International Major Projects Database / 51

References / 53

About the authors / 62

Acknowledgments / 63

Publishing information / 64

Supporting the Fraser Institute / 65

Purpose, funding, & independence / 66

About the Fraser Institute / 67

Editorial Advisory Board / 68

Executive summary

There is general agreement among diverse groups and individuals that Canada's transportation infrastructure desperately requires improvement. As governments move to confront this challenge, it is not enough that they simply commit to building more roads or bridges; the infrastructure must be built on time and on budget, be of high quality, and be well-maintained.

The conventional way for providing transportation infrastructure involves the government hiring a firm to build the facility based on a prescriptive design. The government then takes responsibility for operating and maintaining the facility and perhaps outsources some aspects of care to private companies. With a history of construction-cost overruns and time delays as well as other notable problems, the conventional process has not served Canadians well.

Public Private Partnerships (P3s or PPPs) are an alternative to the conventional process. P3s capture benefits of the marketplace while achieving the government's goals for public infrastructure. This report examines the potential improvements P3s can bring to Canada's transportation infrastructure. At the outset, it is important to note that, while P3s offer several advantages over the usual process, they may not be well suited for every transportation project. Put plainly, P3s are an important option in the government's tool kit and should be given consideration when appropriate.

Defining Public Private Partnerships

To understand the potential benefits of P3s, it is important to first define what they are. Unfortunately, a consensus does not exist on the exact definition of P3s. However, definitions from various reputable sources consistently include three general characteristics: (1) P3s are a partnership arrangement between the public and private sectors for delivering infrastructure; (2) the tasks and responsibilities involved in delivering the infrastructure (which may include service components as well) are shared between the partners; and (3) the risks and rewards involved with infrastructure delivery are also shared.

In a P3, a single private-sector partner is responsible for two or more of the following tasks: design (D), build (B), finance (F), operate (O), and maintain (M). P3s come in various forms with the specific type depending

on what tasks the private partner is responsible for. In a DBFOM, the private partner designs and builds the infrastructure (a road for instance) while providing the up-front financing required for construction; it also operates and maintains the infrastructure.

P3s are not privatization

P3s are not a form of privatization. A P3 is a partnership between the public and private sectors. Unlike privatization, the public sector remains ultimately responsible for the delivery of goods or services. It is the public sector that sets the goals and the desired outcomes of the P3 project and ownership is retained with the public sector. The role of the private sector is to meet the quantity and quality requirements set by the public sector for the transportation infrastructure and related services.

Features of P3s that drive benefits

P3s have several features distinct from those of the conventional process that drive the benefits we observe. One of them is the sharing of risk (and reward) between the partners. Every infrastructure project has an assortment of risks but, in the conventional process, all of these risks are back-stopped by the public sector and, ultimately, by taxpayers. In a P3, the private-sector partner assumes far more risk and this encourages improved performance. For example, if the risks of construction delays are assigned to the private partner, then the private partner has a stronger incentive to finish the project on time. If not, it loses out on some profit.

Another key feature of P3s is the assignment of tasks. A single private-sector partner is given responsibility for multiple tasks—design, build, finance, operate, and maintain—that stretch over a project’s life cycle. Bundling these tasks gives the private partner the incentive to design the transportation infrastructure in a manner that would generate cost savings in both the building and operation/maintenance phases of the project.

Uniquely, P3 projects can include private financing for up-front capital costs. In such cases, the private-sector partner has its own money at risk, which further motivates positive performance. Private financiers provide additional oversight to ensure the private partner delivers.

Performance-based payments give P3s an extra edge. Here is how they work: the public sector establishes the desired outcomes for the transportation infrastructure (such as improved highway safety) and the private sector decides the means of achieving them. Payment to the private partner is conditional on meeting predetermined performance criteria with penalties levied otherwise. This differs from the conventional process whereby the private contractor receives regular monthly payments. Again, for the private partner to make a profit, it must meet the public sector’s goals.

Other P3 features driving benefits include competition for public infrastructure projects and efficiency gains from greater use of the private sector's expertise, particularly in the realm of project management and execution. Together the above features strengthen the incentives in the infrastructure delivery process and can lead to major benefits to taxpayers.

Benefits of P3s to taxpayers

A key tangible benefit of the P3 option is that construction projects are more likely to be completed on time and on budget. This flows from the improved incentives in the P3 model discussed above, including private financing and performance-based payments. It is important to reiterate that in P3s failure to control construction costs and delays results in decreased private profits—not increased taxpayer costs.

Another advantage of the P3 model is the potential for greater value for money over the entire life of a project. While it is difficult to estimate what the alternative cost of using P3s would have been, value-for-money assessments consistently indicate that the risk- and quality-adjusted cost of P3s tend to out-perform the conventional process.

The incentives embedded in the P3 model also encourage innovation in the delivery of public infrastructure. Since the private partner is responsible for managing more risks, a combination of tasks over the project's life, and meeting quantity- and quality-performance targets, this leads to innovative solutions that improve transportation infrastructure and customer service. The report highlights specific examples of P3 innovations and improved customer service.

Politicians are notorious for neglecting or setting aside as items of low priority the upkeep and upgrading of transportation infrastructure in favour of more politically popular spending. P3s have the potential to reduce this vexing problem since the model forces governments to adopt a longer-term approach to infrastructure planning and management. In addition, P3 contracts stipulate maintenance and performance requirements, ensuring public assets remain in a good state.

Finally, P3s allow the government to focus on functions such as defining the level and quality of public services and the private sector to focus on what it knows better: the details of design, construction, and operation/maintenance of infrastructure.

Dispelling myths and concerns about P3s

While the P3 option offers attractive benefits, some critics have voiced concerns about the model. Upon closer examination, however, these criticisms are not very strong. A repeated complaint is that P3s are too expensive because the cost for private firms to borrow in debt markets is higher than

cost to the public sector. However, the two borrowing costs are not directly comparable. The interest rate paid by the public sector does not include the cost of certain project-related risks (like construction cost and time overruns). To claim then that the government has a lower borrowing cost assumes the conventional process is risk free. In reality, risks do exist in the conventional process and they are borne by taxpayers. When it comes to borrowing costs, a fair comparison between P3s and conventional process must price and account for who ultimately is responsible for the risks.

Others concerned about P3s assert that the private sector's desire for profit will increase the cost or decrease the quality of public infrastructure. Put simply, this view fails to account for the improved performance of P3s both in terms costs and quality. Recall, performance-based payments (bonuses for exceeding requirements and penalties for falling short) encourage the private partner to meet the public sector's quantity and quality outcomes. In the extreme case of poor performance, the public partner can terminate the contract. Moreover, competition in the P3 bidding process helps ensure the private sector's rate of return (profit) is at a reasonable level.

Critics also think the complexity of structuring, negotiating, and enforcing P3 contracts results in prohibitively higher costs. So-called "transaction costs" may be higher in P3s but they are not entirely absent in the conventional process. Even though P3s may require higher transaction costs, they formalize an evaluation process of transportation initiatives, including detailed risk and performance assessments, that otherwise would not be undertaken. As P3s become more widely used, standardized processes and procedures are being put in place to reduce transaction costs and improve value for money. That said, P3s may be better suited for larger infrastructure projects where the proportion of transaction costs to total cost is lower.

But a broader discussion about costs must account for shortcomings of the conventional process. When governments play a prominent stewardship role in delivering infrastructure, inefficiencies and failures often result, leading to costs higher than planned for taxpayers. When accounted for, these costs can make the conventional method less appealing despite the higher transaction costs in P3s.

P3s are also criticized for lacking public accountability and transparency. These concerns ignore the fact that a range of disclosure standards are available to strike a balance between guarding the private sector's commercial interests and maintaining standards of public accountability and transparency. And mandatory value-for-money assessments give P3s an extra layer of accountability that does not always exist in the conventional process.

The report addresses other common P3 concerns but finds that, taken together, the arguments are not very strong. Properly structured P3s can produce benefits that outweigh the concerns and risks, and more experience with P3s is leading to innovations that reduce the disadvantages that do exist.

Ensuring P3s are successful and used appropriately

It is tempting to point to specific cases where P3s have encountered problems and then generalize that this reflects poorly on the P3 model as a whole. P3s may not be the right option for every government and every project. Several important conditions must be in place to ensure P3s are ripe for success and a careful weighing of the P3 option must first ensure these conditions exist.

Three broad conditions increase the success rate of P3s. First, the transportation project should have particular characteristics that make it more conducive to the P3 model. For example, the potential to transfer risks to the private partner is important as is the ability for the public partner to clearly define and measure the desired outcomes. The project should also have the potential for innovation and several qualified private firms competing for the contract. Other key characteristics are highlighted in the report.

The second condition is clear and effective distribution of risk between the public and private sectors. Sharing risk is an important driver of P3 benefits but to realize the benefits, risks must be carefully allocated to the correct partner. This means assigning risk to the partner that is most able to manage that risk. Generally speaking, the private sector can better manage business-related risks while the public sector is better suited to handle regulatory risks; some risks can and should be shared between the partners.

Finally, a successful P3 requires a public-sector partner with the capacity and expertise to carry out the procurement process from beginning to end. That means being able to: create and maintain support for the project internally and with the broader public; construct a business plan with a proper value-for-money calculation; and monitor the private-sector partner throughout the contract. The public sector must also have the specialized legal and technical skills required for writing a P3 contract. Since governments typically do not have these capabilities, they can follow best-practice models for P3s and create a specialized office with the necessary expertise. Many provincial governments have already established such agencies; examples are Partnerships BC and Infrastructure Ontario.

Measuring the use of transportation P3s in Canada

The report also measures the use of P3s internationally and within Canada. From 1985 to January 30, 2013, Canada has cumulatively planned, started, or completed 59.5 transportation P3 projects domestically (three of which are shared with the United States). The total (nominal) cost of these projects is approximately US\$44.4 billions. Out of 32 of the world's most industrialized countries over the same period, Canada has planned, started, or completed the sixth highest number of transportation P3s, with the ninth largest cumulative cost.

Within Canada, British Columbia and Ontario are the main locations for transportation P3s with a combined share of 60.5% of the transportation

P3 projects in Canada that are completed or underway. The data analysis in the report reveals two notable Canadian trends: more transportation P3s are being undertaken over time and most of these projects involve some private-sector financing.

Conclusion

The option of using Public Private Partnerships presents an opportunity for Canada to improve its transportation infrastructure. P3s are not a panacea but, where appropriate, they have the potential to provide greater benefits than the conventional model.

Introduction

There is agreement among a diverse cross-section of individuals and groups that Canada's transportation infrastructure desperately requires improvement and upgrade, with the cost of this deficit estimated to be in the hundreds of billions.¹ As governments at all levels move to confront the large and growing need for transportation improvements, it is important to explore different ways to go about fixing the nation's transportation infrastructure. It is not enough for governments simply to commit to building more bridges and roads; the infrastructure must also be built on time and on budget, be of high quality, and be well maintained.

The conventional method of procuring infrastructure has not always served Canadians well. That method, whereby governments direct every phase of the process, including designing, building, financing, operating, and maintaining the infrastructure, has been problematic and prone to risk. As the Organisation for Economic Co-operation and Development (OECD) put it:

In the past public provision of infrastructure has sometimes failed to deliver efficient investment with misallocation across sectors, regions, or time often due to political considerations. Constraints on public finance and recognized limitations on the public sector's effectiveness in managing projects have led to a reconsideration of the role of the state in infrastructure provision. (OECD, 2011: 16–17)

In response to this challenge, many nations have aggressively pursued Public-Private Partnerships (P3s or PPPs) as an alternative method of improving expertise and reducing costs and delays in the construction, operation, and maintenance of public infrastructure. In Canada, the federal government and many provinces have made efforts to increase the use of P3s. By some accounts, P3s currently make up 10% to 20% of Canada's public infrastructure spending (Iacobacci, 2010). This study examines the potential for

1. For different views on Canada's infrastructure problems, see Brox (2008), Hartgen et al. (2008), Mirza (2007), Vander Ploeg (2003), the Federation of Canadian Municipalities (2012), and the Canadian Union of Public Employees (2011).

increased use of P3s in Canada. Specifically, the study examines the different types of P3s and how they could benefit Canada, common concerns about P3s, conditions under which P3s are successful and unsuccessful, and the extent to which P3s are currently used in Canada to deliver transportation infrastructure.

The study does not argue that Public-Private Partnerships are a panacea that can cure all of Canada's infrastructure ills. It is important to acknowledge the limitations as well as the benefits of the P3 process. Instead, the study argues that P3s are an important option for improving infrastructure and should be used more widely where they can realize the greatest benefits.

While P3s are used to deliver a wide array of public infrastructure such as transportation (roads, bridges, airports, seaports, and public transit), utilities (water and waste management), and buildings (hospitals, schools, courthouses, and prisons), this study focuses on transportation, which accounts for 57.3% of total P3 spending in Canada and is by far the largest sector of P3 spending among advanced countries (PWF, 2013; calculations by authors).

Organization of study

The study is organized as follows. The first section defines P3s, explains how they differ from other procurement methods, and outlines the various types of P3s. Section two discusses the benefits that P3s can offer over conventional procurement. Section three addresses common concerns about P3s and acknowledges some of their limitations. The fourth section describes the conditions needed to ensure successful P3s and lessons learned from past mistakes. Section five includes an empirical analysis measuring the extent to which transportation P3s are used in Canada relative to other developed countries; and among the provinces and territories. The final section summarizes the study and concludes.

1 What are Public-Private Partnerships?

This section provides an explanation of what constitutes a Public-Private Partnership. Specifically, the section defines P3s and explains how they differ from other methods of infrastructure procurement; it also outlines the various types of P3s.

Definitions

There is no clear and consistent definition of what constitutes a P3 (OECD, 2008). This lack of consensus has resulted in various definitions. Below are definitions from two reputable organizations.

The Organisation for Economic Co-operation and Development (OECD), an international organization comprising 34 member countries that are among the most developed in the world, defines a P3

as an agreement between the government and one or more private partners according to which the private partners deliver the service in such a manner that the service delivery objectives of the government are aligned with the profit objectives of the private partners and where the effectiveness of the alignment depends on a sufficient transfer of risk to the private partners. (OECD, 2008: 17)

The Canadian Council for Public-Private Partnerships (CCPPP), a national organization whose main objective is to promote and facilitate P3s across Canada,² defines a P3 as: “A cooperative venture between the public and private sectors, built on the expertise of each partner that best meets clearly defined public needs through the appropriate allocation of resources, risks, and rewards” (CCPPP, 2013a).

2. The Canadian Council for Public-Private Partnerships (CCPPP) is a national, member-sponsored organization with representatives from both the public and the private sectors. For more information on the Council, see <<http://www.pppcouncil.ca/>>.

In addition to these definitions, many other reputable sources have provided their own definition of P3s.³ The definitions generally have three characteristics in common: (1) P3s are a partnership arrangement between the public and private sectors; (2) the tasks and responsibilities involved in delivering the service (which may or may not include infrastructure) are shared between the partners; and (3) the risks and rewards involved with service delivery are also shared. Some insist an added feature of P3s is that the cooperative venture be long-term in nature. The differences in definition, in particular the long-term condition, mean that projects can be thought to be P3s by some and not others. This can confuse discussions about P3s.

The private partner in a P3 can be a single firm but is more likely a consortium of multiple firms, consisting of financial institutions (banks, insurance companies), engineering firms, and construction firms.⁴ In cases where the consortium is expected to maintain and/or operate the infrastructure, it could also include an operating company with experience running infrastructure as a business. A consortium is often necessary for securing the required capital and expertise for the project. Collectively, the consortium is responsible for delivering the infrastructure according to specifications outlined in the contract.

3. The federal Crown Corporation, PPP Canada, defines a P3 as “a long-term performance-based approach for procuring public infrastructure where the private sector assumes a major share of the responsibility in terms of risk and financing for the delivery and the performance of the infrastructure, from design and structural planning, to long-term maintenance” (PPP Canada, 2013). The International Monetary Fund (IMF) refers to P3s as “arrangements where the private sector supplies infrastructure assets and services that traditionally have been provided by the government” (IMF, 2004: 4). P3 experts Darrin Grimsey and Professor Mervyn Lewis use the following definition of P3s: “agreements where public sector bodies enter into long-term contractual agreements with private sector entities for the construction or management of public sector infrastructure facilities by the private sector entity, or the provision of services (using infrastructure facilities) by the private sector entity to the community on behalf of a public sector entity” (Grimsey and Lewis, 2002: 108). William Eggers and Tom Startup, authors of a Deloitte research report on Public-Private Partnerships, define a P3 as “a contractual agreement formed between a government agency and a private sector entity that allows for greater private sector participation in the delivery of public infrastructure projects. In some countries involvement of private financing is what makes a project a PPP ... Compared with traditional procurement models, the private sector assumes a greater role in the planning, financing, design, construction, operation, and maintenance of public facilities” (Eggers and Startup, 2006: 5). Finally, the US Department of Transportation defines a P3 as a contractual agreement between a public agency and a private sector entity that allows for private sector participation in the delivery of transportation infrastructure and services (US DOT, 2009).

4. In the literature on Public-Private Partnerships, these consortiums are referred to as Special Purpose Vehicles (SPV).

How P3s differ from other methods of infrastructure procurement

Different methods can be used in the process of acquiring and delivering infrastructure and related services. This process is known as infrastructure procurement. It includes activities such as purchasing from, and contracting and negotiating with, suppliers of the service for the planning, design, and specifications. It may also include long-term operation and maintenance of infrastructure.

Figure 1 shows four broad methods along a continuum from full public responsibility to full private responsibility. Each procurement method employs varying degrees of involvement from the public and private sectors. The methods range from pure public provision, where the government procures the infrastructure with no involvement from the private sector, to pure private provision, where the government is not directly involved at all. P3s are situated between conventional procurement and pure private provision. The following discussion first explains conventional procurement and distinguishes it from P3s; it then distinguishes P3s from privatization, a form of pure private provision.

P3s compared to conventional procurement

Conventional procurement is the usual method used by governments to procure construction projects and occasionally services such as operation and maintenance. In conventional procurement, the planning and design is completed first, either by the government or under contract, followed by a separate competitive tendering process for the construction phase based on this design, normally with a very prescriptive set of technical specifications. The chosen bidder is awarded a contract to complete the work at a set price. The government pays the contractor as work progresses, perhaps through regular monthly payments. After completion, the government assumes responsibility for operating and maintaining the asset. Following the construction and turnover of the facility to the government, there is no long-term or ongoing contractual relationship between the parties. The relationship is one-off in nature.

P3s differ from conventional procurement in some important respects. In a P3, the government usually sets the quality and quantity required and, without being too prescriptive about the technical requirements and means of delivery for the required services, allows the private-sector party to design and build the asset. Put another way, government requirements focus on performance measures based on output, not input.

The private partner normally puts up its own financing in a P3 and payments by the public sector only occur when the asset or services are delivered according to specifications. This feature of P3s provides powerful incentives for the private partner to deliver infrastructure on time and on budget and of high quality.

Figure 1: Methods of infrastructure procurement on a continuum from public to private responsibility

P3s also give a single private partner multiple responsibilities for two or more phases of infrastructure delivery, which can entail designing, building, operating, and maintaining the asset. Doing so passes on the risk of faulty design from taxpayers to the private sector since any design failures or redesign expenses that could cause increased construction costs or project delays will be borne by the private partner. In conventional procurement, each phase is procured separately.

In both conventional and P3 procurement, the government uses a competitive tendering process to find the best combination of project team and cost effectiveness for the infrastructure project. In the case of a P3, with operation and maintenance tasks in the hands of the private sector, competition is for a contract covering the full life cycle of the project, not just design and construction. In addition, unlike conventional procurement, the government does not pay the private sector for a capital asset and then end the contract. Instead, the government typically also pays for a stream of services that the private sector generates with the asset since the private sector is usually (but not always) responsible for the operation and maintenance (OECD, 2008).

Another key way in which P3s differ from conventional procurement is that the private sector assumes more responsibilities throughout the procurement process. As a result, the private sector naturally carries more risk, especially if it provides financing for the project.

Finally, P3s give stewardship of the project to the private partner (Iacobacci, 2010). The freedom to manage and execute the project means there is greater scope for the private sector to use its expertise more effectively compared to conventional procurement, where the public sector or contract management firm has the stewardship responsibility. **Table 1** summarizes the key differences between P3 and conventional procurement.

P3s compared to privatization

There are also notable differences between P3s and privatization, a form of pure private procurement. Through privatization, a public asset or service is sold outright to the private sector without direct government involvement thereafter. The privatization of CN Rail would be an example. A P3, on the other hand, maintains a long-term performance contract between the government and private-sector parties.

Table 1: Key differences between Public-Private Partnerships and conventional procurement

Public-Private Partnerships (P3s)	Conventional procurement
Integration of multiple project phases	Each project phase procured separately
Contract sets desired outcomes	Contract dictates means of delivery
Payment conditional on delivery	Regular payments throughout construction
Part or all of project financed by private sector	Project financed mostly by public sector
Private-sector management	Public-sector management

Source: Adapted from Iacobacci (2010).

In a P3, the public-sector partner acquires services from the private sector on behalf of taxpayers and retains ultimate responsibility and accountability for the delivery of the services (although the infrastructure and related services are provided by the private sector over an extended period). By contrast, when a government entity is privatized, the firm that takes over the business assumes sole responsibility for delivering the service.

Another factor distinguishing P3s from privatization is the explicit alignment of objectives between the public and private sectors (OECD, 2008). In a well-structured P3, there is a formal business arrangement between the two sectors that ensures the private sector's profit objective matches the government's service delivery objective. The details of this arrangement are specified in the contract and include the general rights and obligations of each party (that is, the quantity and quality of services required) along with agreed upon payments for the services (Grimsey and Lewis, 2004). Privatization does not involve the same explicit alignment of objectives.⁵ Contrary to the misinformation circulated by opponents of P3s, they are not a form of privatization.

Types of Public-Private Partnerships

The types of Public-Private Partnerships vary depending on which partner is responsible for performing five basic tasks over the life of the project: design, build, finance, operate, and maintain. Each type typically gives the private partner responsibility for a combination of at least two tasks, starting with

5. This is not to say that privatization would not accomplish the desired goals, or that privatization would not produce a superior outcome to provision solely by government; but only that, in a privatization, the goals identified by government are not explicitly laid out, with payment linked to their achievement, as they are for a P3.

the type labelled Design-Build, which gives the private sector a relatively low degree of responsibility and is in many ways similar to conventional procurement. Moving to the other limit, Design-Build-Finance-Operate-Maintain consists of the highest degree of private-sector responsibility and risk (**figure 2**). In general, as the roles and responsibilities of the private sector expand—that is, moving from left to right on the spectrum of P3 types in figure 2—the private sector bears a larger portion of the risks involved in delivering the project.⁶

Below are descriptions of the types of P3s shown in figure 2.⁷ It should be noted that, much like the definition of P3s itself, there is some confusion regarding types of P3s. Different organizations and individuals can classify the same project as a different P3 model. P3 contracts are typically and necessarily complex, which can open the door to uncertainty on the precise type of P3 being planned. However, the broad definitions that have been provided here can serve as a guide to understanding the variations that exist and are used.

Design-Build (DB)

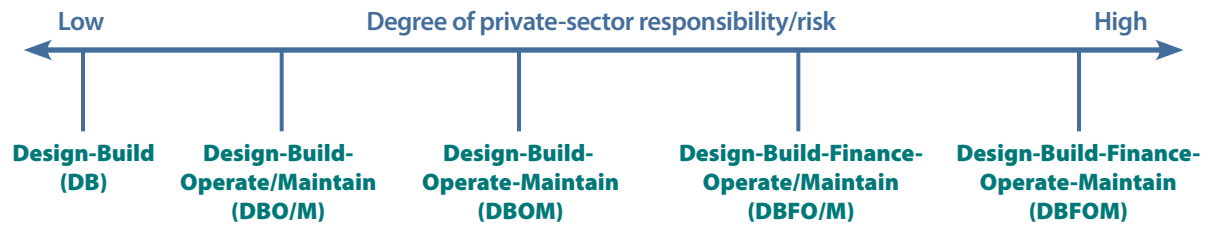
Design-Build (DB) combines the responsibilities for designing and building the infrastructure and assigns them to a single prime contractor. The contract often specifies that the private partner will be paid a fixed price for delivery of the infrastructure. The government provides up-front capital requirements (or progress payments contingent on performance requirements being met) but shifts the risk and responsibility for cost overruns and completion delays to the private partner, which builds the facility based on its own design. The government assumes responsibility for operating and maintaining the facility.

The DB model is not universally considered a type of P3. Some definitions used for P3s require an ongoing partnership between the public and private sector after construction is complete. As in conventional procurement, the relationship in a DB model is short term and ends once the infrastructure is built and contract specifications are met. Other definitions insist that a procurement contract must also contain an element of private financing to qualify as a P3 (Iacobacci, 2010), which the DB model does not. At the same time, organizations like the US Department of Transportation do include DBs in their definition of P3s (Istrate and Puentes, 2011).

In many ways the DB model is the weakest of the P3 types; it fails to capture the benefits of quality assurance and cost reductions that other P3 types have. Since the partnership ends upon construction, the same incentives do not exist to care for the full life of the infrastructure as in other models.

6. However, this does not suggest that there is a linear relationship between risk and responsibility.

7. These descriptions are drawn from St-Jean (2008: 40-42) and Eggers and Startup (2006).

Figure 2: Types of P3s for new transportation infrastructure projects

Source: adapted from Eggers and Startup (2006: 5).

Design-Build-Operate/Maintain (DBO/M)

Design-Build-Operate/Maintain (DBO/M) provides a bundle of services to the government as outlined in a long-term agreement. The private partner (prime contractor) is responsible for the design and construction of the facility, and either the operation or maintenance.⁸ The government retains ownership of the physical asset; it also provides the up-front capital to build the asset as well as payments for either operation or maintenance. This payment is subject to reduction if service performance standards are not met (sometimes there is a bonus if standards are exceeded). At the end of a predetermined period, the operation and maintenance of the facility is transferred to the government, or the services are renewed or re-tendered. The DBO/M model is superior to DB model because it creates an incentive for the private-sector partner to ensure quality and cost containment for the longer term, but there are risks involved in separating the operation and maintenance functions.

Design-Build-Operate-Maintain (DBOM)

Design-Build-Operate-Maintain (DBOM) has the same structure as DBO/M except that the private partner is responsible for both operation and maintenance of the infrastructure. No up-front financing is provided by the private partner.

Design-Build-Finance-Operate/Maintain (DBFO/M)

Design-Build-Finance-Operate/Maintain (DBFO/M) is a P3 model in which the full up-front capital financing is added to the list of the private sector's responsibilities.⁹ The private partner typically does not receive any payment until the asset is delivered and working, and subsequent payments are subject

8. A type of P3 known as Build-Operate-Transfer (BOT) is similar to DBO/M but does not include the design element. At the end of the contract period (also known as the concession period), the asset is transferred to the government.

9. The DBFO P3 is also known as Private Finance Initiative (PFI) in the United Kingdom and Build-Own-Operate-Transfer (BOOT) in the United States.

to the same conditions as in the DBO/M and DBOM models. Throughout the contract period, the private partner collects a stream of payments from the government or from users of the facility, or a combination of both as specified in the contract. During this time, the government plays an active, overseeing role by monitoring the private partner's performance, enforcing the contract's provisions, managing the relationship, and dealing with contingencies unforeseen in the original contract. When the contract expires (usually in 20 to 30 years), stewardship of the asset is either transferred to the government or retained by the private sector.

Design-Build-Finance-Operate-Maintain (DBFOM)

Design-Build-Finance-Operate-Maintain (DBFOM) has the same structure as DBFO/M except the private partner is responsible for both operation and maintenance of the infrastructure.

The list of P3 models above is not exhaustive and reflects the more typical types used in Canada for new infrastructure projects. However, there are a number of additional ways that responsibilities can be combined and assigned to the private-sector partner. For example, the private-sector partner can take responsibility of the operation and maintenance (O&M) of an existing infrastructure without being required to do any building.

The decision about which type of P3 model to use for a particular project depends largely on the nature of the transportation infrastructure involved as well as other conditions, including whether there is scope for innovation in design and service delivery, identifiable revenue streams, measurable results, synergies from bundling responsibilities, and opportunities to transfer risk optimally.

2 The benefits of Public-Private Partnerships

Public-Private Partnerships are gaining traction because they have the potential to offer numerous benefits over conventional procurement. This section begins with a discussion of six key features of the P3 model that drive the benefits.¹⁰ It then goes on to describe the benefits. **Figure 3** summarizes both the drivers and benefits of P3s.

The drivers of P3 benefits

1 Risk sharing

Increased risk sharing with the private sector is perhaps the most important source of benefit from the P3 model. In fact, many of the benefits flow from risk sharing. In the areas that risk has been assigned to the private-sector partner, it creates pressure to generate good results. If the private partner does not generate good results in those areas, it—not taxpayers—reaps most of the consequences.

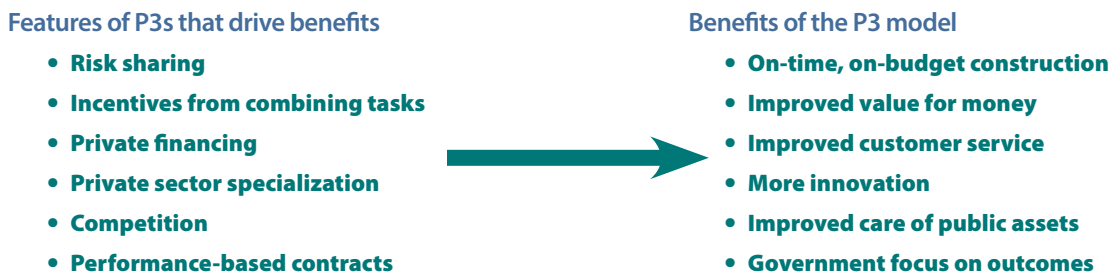
All transportation infrastructure projects are vulnerable to a number of risks, which can be considered under five broad categories: regulatory and political, financial, construction, operating, and demand.¹¹

Regulatory and political risks

Regulatory and political risks are changes in government regulations and policies that could adversely affect the project. Examples include changes in tax policy (for example, the imposition of a carbon tax or an increase in fuel taxes), land-use requirements, and the availability of substitute routes. The election of a new political party or leader may give rise to political risks, particularly if the government's mandate regarding the project changes. Regulatory expropriation is also a risk in some cases.

10. Iacobacci (2010) lists four features of P3s that drive efficiency gains: performance-based contracts, optimal risk allocation, integration of tasks, and private financing.

11. Other risk categories exist in addition to the five listed, including technical risk, environmental risk, and project default risk. For a discussion of these and other types of risk associated with infrastructure projects, see Grimsey and Lewis (2002) and Poschmann (2003).

Figure 3: The drivers and benefits of P3s

Financial risks

Financial risks include lack of capital and inappropriate debt management. These stem from changes in borrowing costs or general economic conditions, fluctuating inflation and exchange rates, as well as inadequate risk management of revenue streams and financing costs. Ultimately, financial risks could result in project failures or insolvency.

Construction risks

Construction risks include delays due to unforeseen construction problems or site conditions, poor design specifications, faulty construction techniques, inadequate technologies, and shortages of inputs like labour, heavy machinery, and raw materials in the production process. These risks can result in cost overruns, failures to meet scheduled service delivery, and difficulties in complying with regulations.

Operating risks

Operating risks include higher than expected operation and maintenance costs and failure to meet performance specifications or output quantities. These risks could be caused by poor design specifications.

Demand risks

Demand risks include an array of factors that decrease the demand for a facility after completion.¹² Demand risk can arise from changes in consumer preferences, the emergence or disappearance of substitute or complementary products, competition, and changes in income and demographics (OECD, 2008). For example, changes in transportation policies that give rise to the construction of a new road can create competition for a nearby existing road and reduce drivers' demand. The risk of reduced demand is especially problematic for transportation facilities where user fees are used to recoup capital costs and operation/maintenance costs.

12. There is also the risk that demand could increase beyond the facility's supply capacity.

While projects delivered through conventional procurement involve these risks, the risks may not be transparent and thus their associated costs may not be properly identified and priced. Under those conditions, taxpayers often bear, or in financial terms “underwrite”, most, if not all, the risks that inevitably materialize. A classic example of this is the BC Fast Ferries project in the late 1990s (BC Auditor General, 2000).

In the case of a P3, the long-term nature of the contractual agreement and, in some cases, up-front provision of financing by the private sector forces a detailed analysis of the risks associated with a project at the outset (Grimsey and Lewis, 2004). The private sector ultimately takes responsibility for many risks that would otherwise be carried by taxpayers. This has the additional advantage of ensuring due diligence in identifying possible problems.

Proper distribution of risk (and reward) between the public and private sectors is a critical determinant for achieving good value for money and is essential to the success or failure of a P3. An important guiding principle for allocating risks in a well-structured P3 is that risks be shared between the two sectors and allocated to the party best equipped to manage them (de Bettignies and Ross, 2004). This means risks should be allocated to the party that has the largest influence on the likelihood of an adverse event occurring or the party that can best deal with the consequences of an adverse occurrence (OECD, 2008).¹³

For instance, the private sector has an advantage in managing normal business risks like construction and operating risks, including risks related to designing the facility properly, incurring cost overruns, completing the facility on time, and meeting performance standards. The public sector, on the other hand, can better manage regulatory risks and political risks. Some risks, where neither sector holds an advantage (such as risks from random events like natural disasters) could be shared or insured against where possible.

Risk allocation can be a tricky process but more experience with the P3 model over time will inform best practices.¹⁴ In early Canadian P3s demand risk was assigned to the private-sector partner. However, experience revealed

¹³ If risk it does not control or that it is unable to manage is transferred to the private sector, the private partner will likely demand a higher rate of return to fund the project.

¹⁴ A key factor in effective risk allocation is the correct alignment of economic ownership with actual risk bearing (IME, 2004). When such an alignment is incorrect, a P3 project could fail. Consider a new toll facility where the private partner bears most of the demand risk but legal ownership remains with the government. The private partner would not be able to manage demand risk properly since it could not legally affect the toll level or carry out necessary changes to the facility or to competing facilities to increase demand. A case in a point is the SR 91 private toll road in Orange County, California, where the overseeing public agency, Caltrans, signed a contract in which it agreed not to build any new (free) road capacity parallel to or competing with the privately financed toll road, except for road improvements necessary to assure safety. When Caltrans announced that it would widen some lanes nearby for safety purposes, the private contractors fervently

that the public-sector partner is better able to control this risk through transportation policies. As a result, more recent Canadian P3s allocate demand risks to the public sector (Iacobacci, 2010). In fact, private-sector firms with a sophisticated understanding of P3s now avoid accepting demand and revenue-related risks (Vining and Boardman, 2008a).

The bottom line is that P3s can transfer certain risks away from taxpayers to the private sector. If appropriate, the transferred risk can create powerful incentives for effective performance and protect taxpayers from the costs of unexpected failures.

2 Combining tasks

In conventional procurement, the private sector's role is typically limited to that of a subcontractor. Since the contract is usually for a single task (say, construction), the private sector has little incentive to devise integrated solutions that would be of benefit in other phases of the infrastructure delivery process (like operation or maintenance). With P3s, a single private-sector consortium is responsible for a combination of tasks, including designing, building, financing, operating, and maintaining the infrastructure. In other words, the up-front engineering and design work for the project is often combined with the subsequent management, operation, and maintenance of the project (and in some cases the revenue stream). The consortium has a strong, built-in incentive to increase quality and efficiency over the entire life of the project because it reaps a proportion of the benefits (and costs) (de Bettignies and Ross, 2004). In other words, bundling tasks and assigning responsibility to one entity internalizes the benefits (or costs) of doing a better (or worse) job. For example, if the entity doing the construction is also responsible for operating and maintaining the facility, it has an incentive to make up-front investments either in the design or construction of the project that increase quality, reduce repairs, and lower operation and maintenance service costs in the future.¹⁵

3 Private financing

Not all P3 projects involve private financing but those that do add an extra incentive for the private-sector partner to produce desired outcomes.¹⁶

objected. The toll road operators filed a suit against Caltrans for breach of contract, which settled out of court and stipulated that Caltrans not widen the road.

^{15.} In addition, there may be complementarities or “economies of scope” from making one entity responsible for a combination of tasks. The formal definition of economies of scope is that the average cost of production decreases as a result of a firm increasing the number of different goods it produces.

^{16.} It is important to note that in the 1990s and early 2000s some governments used private financing to hide liabilities for infrastructure projects “off the books”. This practice occurred under the government’s old cash-based system of accounting to avoid large capital costs for new infrastructure that would have a negative impact on the government’s

Consider a P3 where the private partner provides up-front financial capital during the construction period and receives payment only when the project (or a component of it) is completed according to the specifications outlined in the contract. By providing the initial financing, the private partner has its own money at risk and therefore a strong incentive to meet or perhaps even exceed expectation so that it can begin generating revenues to recover its costs (Grimsey and Lewis, 2004). Failure to restrain costs or produce positive results means less profit or an investment loss for the private-sector partner. This incentive is not present in conventional procurement. An added benefit of private financing comes through oversight. Private lenders and investors that have “skin in the game” provide oversight in addition to the public sector and help ensure that private contractors are diligent and meet deadlines.

4 Private sector specialization

P3s make greater use of the specialized expertise in the private sector than conventional procurement, particularly in the realm of project management and execution. This allows the public sector to harness the private sector to the benefit of taxpayers. One particular advantage of P3s is driven by economies of scale from private-sector specialization. Economies of scale occur when the average cost per unit falls as production increases since fixed costs are spread over more units. Specialization allows for large-scale expansion and can facilitate this reduction in costs. In the context of P3s, private-sector firms are often more specialized, larger, and have more experience in the construction and operation of businesses than government. They can therefore generate the volumes of business needed to get unit costs down to their minimum (de Bettignies and Ross, 2004). For example, a private provider may have similar operations in multiple locations (locally, nationally, or internationally) and could save on costs by buying large quantities of materials at lower prices or by using and transferring the knowledge gained at one location to another. These arrangements also provide opportunities for training and development of expertise that certain projects lack.

5 Competition

An important driver of P3 benefits comes from competition. Numerous private-sector firms (or consortiums) competing to provide a public service

balance sheet. Under the newer and widely adopted accrual-based system, the accounting advantage of P3s for Canadian governments has largely disappeared (for details, see Fussell and Beresford, 2009: 27-31; Iacobacci, 2010: 7). However, with accrual-based accounting, there is a lack of consistent and comparable P3 standards in public-sector accounting in Canada, which has led to accounting inconsistencies for P3s across provinces and projects. The Canadian Council for Public-Private Partnerships (CCPPP, 2008) has offered some recommendations to help address this issue.

as opposed to government acting as the monopoly provider can drive efficiency and innovation.¹⁷ As Grimsey and Lewis put it: “competition creates an environment that encourages bidders to be innovative in their design and efficient in service delivery” (2004: 135). Due partly to the competitive tendering process, taxpayers can benefit from creative private-sector solutions for infrastructure design, construction, and facility management. As de Bettignies and Ross (2004) note, although one service provider will ultimately prevail, “competition for the market” induces the private sector to lower costs, raise quality, and provide innovative solutions in their bids.

The number of bidders competing for a P3 contract could be lower than is normal in other competitive tendering processes because P3s may require that a consortium be formed and require other transaction costs, which may discourage some potential bidders. Even with fewer bidders, P3s can be advantageous since bidding firms compete for all phases of the project not just the initial construction phase.¹⁸

By contrast, pure public provision gives the government a monopoly over infrastructure provision. As a result, the government has little motivation to be efficient and innovative, and provide taxpayers value for money.¹⁹ An additional concern is that the government may simply not possess the necessary expertise or resources to carry out the job efficiently.

6 Performance-based contracts

As discussed in section two, P3 contracts differ from a conventional procurement because contracts focus more on outcomes rather than prescriptive means of delivery. Performance-based contracts encourage innovation and provide incentives for the private partner to find efficiencies and cost savings, but not at the expense of quality. In a typical P3 performance-based contract, the government pays the private partner only if preestablished outcomes or performance standards are achieved. Such an arrangement may

¹⁷. The academic literature provides well-documented evidence on the benefits of incorporating competition into public service provision. For example, an international survey conducted by Domberger and Rimmer (1994) found that the use of competitive tendering and contracting for public services achieved average operational and maintenance cost savings of 20% over government provision. Similarly, Savas and McMahon (2002) found that the use of competitive contracting in major transit systems in the United States and Europe has produced reductions in operating costs ranging from 20% to 51%, with savings in excess of 35% being the norm. For more evidence on the benefits of contracting out public services to the private sector, see Domberger et al. (1995), Levin and Tadelis (2007), and McDavid (1988).

¹⁸. In a Design-Build model this advantage is not fully realized because the private-sector bidder would only be competing for the design and build phases of the project.

¹⁹. See Clemens et al. (2007) for numerous examples where the government has failed to provide public services efficiently.

use “availability payments,” which are payments made by the government to the private partner based on the facility being available for use when needed and meeting certain requirements with penalties levied otherwise. Typical availability criteria include accessibility and compliance with safety regulations. “Shadow tolls” are another form of payment based on outcomes. With shadow tolling, the private operator receives a payment from the public-sector authority based on use of the facility. Wishing to receive payment, the private operator has an incentive to provide good customer service, say by enticing drivers to use its road.

The benefits of Public-Private Partnerships

The rest of this section discusses the tangible benefits that the P3 model provides over conventional procurement.

1 Better performance in the construction phase through delivery on time and on budget

Conventionally procured public infrastructure projects have a tendency to experience cost overruns and considerable delays (Clemens et al., 2007). In comparisons of performance during the construction phase, evidence shows that P3s outperform conventional procurement by lowering construction costs and shortening completion times.²⁰

While comprehensive evidence on the actual construction performance of P3s in Canada is limited, a recent report by Iacobacci (2010) provides initial results from a series of Canadian P3s reaching financial close from 2004 to the time of writing. The report examined the scheduled and actual completion dates for the construction portion of 19 Canadian P3s (at the time, only 19 of the 55 P3s examined had completed construction). Of those 19, 17 projects (almost 90%) finished ahead of or on schedule.²¹ These positive results are reinforced by international evidence.

For instance, a study commissioned by Her Majesty’s (HM) Treasury in the United Kingdom examined the performance of 50 large infrastructure projects each with values exceeding £40m in 2001 dollars (Mott MacDonald, 2002). Of the 50 projects, 39 used conventional procurement and 11 used the P3 model. The study compared the planned and actual performance of the projects and found that projects using conventional procurement exceeded their

²⁰. Since the present-value cost of operation and maintenance in some P3s may dwarf capital costs, savings in capital costs during the construction phase may not be very large for the overall project.

²¹. The two late projects were delayed two months and the costs were borne by the private-sector partner; neither project was a transportation P3.

planned construction completion time by an average of 17%, while P3 projects were completed early by an average of 1% (Mott MacDonald, 2002).²² In terms of costs, conventionally procured projects exceeded their planned capital costs by an average of 47% compared to virtually zero for P3 projects.²³ The study cited improved distribution of risk between the public and private sectors as the main reason for the P3s performance advantage. In fact, improved risk allocation was responsible for 60% of the cost savings (Mott MacDonald, 2002).

The National Audit Office (NAO) in the United Kingdom identified similar findings when it compared the construction performance of 37 P3 projects to the historical performance of infrastructure projects delivered through conventional procurement (NAO, 2003). The NAO reported that 73% of conventionally procured projects experienced cost overruns, whereby construction costs exceeded their contract price, compared to 22% of P3s (NAO, 2003). The NAO also reported that 70% of government projects were delivered late while the corresponding figure for P3s was only 24% (NAO, 2003). Importantly, the NAO noted that none of the increases in P3 costs after contract award were due to the private consortium alone. In some cases, government departments changed specifications from those for which the private consortium had bid so the price increased to reflect the changes. The NAO also noted that these changes would have led to price increases under conventional procurement.

A report commissioned by Infrastructure Partnerships Australia compared the performance of 21 Australian P3 projects with 33 conventional procurement projects. With respect to construction costs, the report found that P3s are more cost efficient compared to conventional procurement; the difference was as great as “30.8% when measured from project inception, to 11.4% when measured from final outcome” (Duffield and Raisbeck, 2007: 26).²⁴

The report also found that projects using conventional procurement were completed later than P3s relative to what was originally planned. From the signing of the final contract to project completion, P3s were on average completed 3.4% ahead of time, while conventionally procured projects were completed on average 23.5% behind time (Duffield and Raisbeck, 2007).²⁵

22. Completion time was measured as the time between contract award and works completion. Exceeding the completion time would mean that the actual completion time exceeded the estimated completion time allowed in the business case.

23. The Mott MacDonald (2002) study also found that conventional procurement resulted in operating costs that exceeded initial estimates by 41%, although there was limited evidence to draw from since not all projects in the sample had reached the operation stage.

24. In absolute terms, the P3 cost advantage was significant. For P3 projects worth a total AU\$ 4.9 billion, the net cost overrun was AU\$ 58 million. For AU\$ 4.5 billion of traditional procurement projects, the net cost overrun amounted to AU\$ 673 million.

25. Note that this does not include the bidding and negotiation process and thus should not be interpreted as demonstrating that P3 projects are faster from beginning to end.

Overall, the report concluded that “[P3s] provide superior performance in both the cost and time dimensions, and that the [P3] advantage increases (in absolute terms) with the size and complexity of projects” (Duffield and Raisbeck, 2007: 1).

A survey on construction risk in P3 projects conducted by Standard & Poor’s drew responses from 161 experienced P3 market participants in 22 countries, including bankers, construction contractors, procuring agencies, technical and financial advisors, insurers, and project companies (Bain and Plantagie, 2007). The results indicated that more than 90% of those surveyed agreed, or agreed with minor qualifications, that P3s had a better track record in the construction phase of delivery than conventional procurement.

Finally, in a review of P3 case studies in the United Kingdom that included both positive and negative experiences, Pollitt concluded that P3 projects had been “delivered on time and to budget a significantly higher percentage of the time” (2005: 227).

2 Greater value for money expected over the project’s life cycle

The incentives embedded in a P3 from bundling tasks encourage the private partner to contain costs over the life cycle of the project. As discussed above, the reason is that the private partner is given multiple responsibilities that stretch over the project’s life cycle, including operation and maintenance of the infrastructure. The private partner has an incentive to minimize costs early in the design and building stages because it is the entity either gaining the benefits or paying the costs of those decisions.

Compared to conventional procurement, P3s have the potential to achieve greater value for money in infrastructure provision and service delivery.²⁶ Taxpayers ultimately get better value for their tax dollars. It is unfortunately difficult to calculate the *actual* value for money derived from P3 projects since transportation infrastructure projects take place over the course of decades and it is only at the end of the project that the full cost can be calculated. Even then it is impossible to know for certain what another procurement model would have cost to deliver the same project.

Nevertheless, attempts have been made to estimate the difference in life-cycle costs. Governments in leading P3 markets such as the United Kingdom, Australia, and British Columbia use a tool called the Public Sector Comparator (PSC) to help determine whether value for money can be achieved through P3s.²⁷ The PSC is the estimated cost to the government of

26. P3s using the Design-Build models do not have the same potential because they are short-term relationships and the full life-cycle benefits cannot be realized.

27. British Columbia has its own version of the Public Sector Comparator: the Capital Asset Management Framework (CAMF). For details, see <<http://www.fin.gov.bc.ca/tbs/camf.htm>>.

delivering a project through conventional procurement.²⁸ While calculations of the PSC differ across individual transportation authorities, the PSC generally includes the anticipated capital, operating, and administrative costs over the project's life cycle. Also included in the PSC are quantified costs of various project-related risks as well as other hidden or assumed costs to the public sector. For transportation projects that produce future streams of revenue (e.g., tolling) the expected revenue is deducted from the cost of the PSC.²⁹

When authorities are deciding on whether to pursue a P3 or conventional procurement, they compare the PSC to a series of private-sector P3 bids identified through a competitive tendering process. The P3 option should be selected if it delivers greater value for money and one indication of greater value is if life-cycle costs of the P3 are lower than those of the PSC. This is not the only reason to select a P3:³⁰ a P3 can be more costly than conventional procurement but still offer better value for money if the expected service quality exceeds that under conventional procurement and the increased quality is a valid consideration.

The results of PSC comparisons are generally favourable to P3s. In his report on Canadian P3s, Iacobucci (2010) examined value-for-money assessments for 55 projects, 14 of which were for transportation infrastructure. The results indicated that P3s produce "prospective" savings ranging from 0.8% to 61.2% of the cost of conventional procurement.

In the United Kingdom, a study of 29 P3 projects found that P3s achieved average cost savings of 17% relative to conventional procurement, where the costs of conventional procurement were measured by the Public Sector Comparator (Andersen and Enterprise LSE, 2000). Likewise, a review of eight P3 projects in Australia found that each produced equal or better value than the option of public-sector provision (Fitzgerald, 2004). Specifically, the weighted average savings of P3 projects was 9% compared to the risk-adjusted Public Sector Comparator.

Government officials in the United Kingdom consistently perceive P3s as providing good value for money. In a survey of 98 projects by the UK's National Audit Office in 2001, 81% of the public authorities said P3s were

28. The Public Sector Comparator is expressed in present-value terms. Present value refers to the value on a given date of a future payment or series of future payments, discounted to reflect the time value of money and other factors such as investment risk. It is important to note that present-value computations for infrastructure projects are complex since several factors affect the planning process and modifications to plans are consistently made over the life cycle of the project.

29. For examples of PSC calculations from around the world, see United Kingdom, Department of the Treasury (2004), Infrastructure Australia (2008), and OECD (2008).

30. Other considerations for determining value for money include better risk allocation, faster project implementation, improved service quality, and generation of additional revenue (European Commission, 2003).

achieving value for money from their P3 contracts, while only 4% described value for money as “poor” (HM Treasury, 2003). A more recent survey of Scottish local government authorities found similar results (CEPA, 2005).

Critics of P3s, however, argue fairly that these results are not conclusive. The PSCs, like all forecasts, are only as good as the variables that go into them.³¹ While the PSC comparison is an imperfect tool, the incentives embedded in the P3 model nonetheless encourage greater value for money.

3 Improvements in customer service

P3s can improve customer service in the area of infrastructure. For example, projects that rely on user fees for revenue give the private sector a strong incentive to provide high-quality customer service (Eggers and Startup, 2006). Consider a toll-road initiative where the private sector finances the initial design and construction and has the responsibility for operation and maintenance. To ensure that drivers use the road and pay for access, the private operator must keep drivers satisfied by providing good value for money. This entails properly maintaining the road by fixing pot holes in the pavement, ploughing the road when it snows, and keeping the road clear of debris. In addition, the private operator may increase customer satisfaction among end users by providing innovation in customer service delivery, including more convenient and user-centred services. The potential for customer service improvements in P3s vis-à-vis conventional procurement is greater still through the use of performance-based payments for meeting certain quality and quantity standards.

4 Increased scope for innovation in infrastructure delivery

The incentives in the P3 model help foster innovation. With properly structured contracts, the private partner is encouraged to come up with new and improved ways to meet the project’s requirements (Corner, 2006). These incentives flow from a combination of features embedded in the P3 model, including risk allocation, combining tasks, and performance-based payments.

Grimsey and Lewis (2004) cite a real-life example of how combining tasks in a P3 for hospital infrastructure resulted in design innovation and reduced operational costs. In the design phase for a UK hospital, the private partner engineered window ledges to tilt downwards at a 45-degree angle to prevent patrons from leaving garbage on them. This later reduced cleaning costs during the project’s operational phase.

³¹ Siemiatycki and Farooqi (2012) discuss possible problems involved in calculating risk for PSCs using Infrastructure Ontario as a case study. They point out that risk is the most important input to a PSC model and that it could make the difference between a P3 project’s being considered to offer value for money or not. They conclude that risk assessments must be consistent and transparent in order to ensure the validity of the PSC.

Innovation is important for reducing costs but also for improving care of customers. Consider the following example of an Australian transportation P3 (cited in Eggers and Startup, 2006: 9). Users of CityLink, a toll road in Melbourne, Australia, receive alerts when their account is low and can top up their accounts from their mobile phone. A mobile customer-service unit travels the city continuously visiting customers at work and at home, helping install tags and answer account-related questions. Dissatisfied customers can file complaints with CityLink's independent dispute-resolution service that investigates complaints and proposes ways to resolve the issues.

British Columbia's Sea-to-Sky Highway Improvement project is a Canadian transportation P3 that included innovation in the construction phase (see Sorensen, 2009). One of the contract's requirements was to minimize traffic congestion during construction. To meet this challenge the private partner built "half bridges" allowing traffic to continue despite the construction. This technique was not commonly used in British Columbia before the Sea-to-Sky P3. Since payment was based on achieving outcomes (minimizing traffic congestion), the incentives embedded in the contract encouraged the private partner to find innovative solutions.

5 Improved care of public assets

A major pitfall of conventional procurement is that governments often take a short-term perspective on managing infrastructure, rarely budgeting with a longer horizon than the upcoming year (OECD, 2008). As a result, there is a tendency for maintenance and rehabilitation work on infrastructure to be insufficient, thus shortening their lifespan and contributing to backlogs (Burlleton, 2006).

Public-Private Partnerships, on the other hand, force governments to adopt a long-term approach to infrastructure planning and management with contracts binding the public and private sectors over an extended period (usually 20 to 30 years). The long-term commitments and obligations ensure that public assets are not neglected or set aside as items of low priority by the political process. In addition, P3 contracts contain maintenance and performance requirements that ensure assets remain in a good state. In a properly structured P3 contract, failure to uphold these requirements results in the imposition of financial penalties and, ultimately, termination of the contract.

6 Governments focused on infrastructure outcomes

Finally, Public-Private Partnerships free up governments to focus on determining the level and quality of outputs they want from publicly provided goods and services. For instance, governments can define how much traffic capacity they want but leave the decisions about how best to provide solutions to the private sector, where the necessary expertise lies for properly designing, building, maintaining, and operating infrastructure facilities as well as other business operations.

3 Common concerns about Public-Private Partnerships

While Public-Private Partnerships can offer many benefits, some have criticized this method of procuring infrastructure. This section addresses their concerns.

Concern *P3s are too costly because the public sector can borrow at a lower interest rate than the private sector.*

The often-used argument that the public sector can borrow more cheaply is the source of much anti-P3 sentiment. The premise is that governments can raise funds for large capital projects in bond markets at a lower interest rate than the private sector. However, this argument misses a key point: the public sector's borrowing rate does not price the cost of project-related risks (that is, design, construction, and operating risks). The outright claim that the government has a lower cost of borrowing therefore wrongly assumes that conventional procurement involves no risk.³² The reality is that conventional government procurement contains substantial risks (such as cost and time overruns) and these risks must be accounted for because the costs are ultimately backstopped by taxpayers. Indeed, taxpayers pay the bill when there are construction delays or quality problems in conventional procurement. In P3 procurement, the private sector is on the hook for those risks and the related costs. When it comes to the cost of borrowing, a fair comparison between P3s and conventional procurement must price and account for who bears the risks (Murphy, 2008).³³

³². For more on the myth of government “risk free” borrowing, see Duffield and Raisbeck (2007: 19-20). Also see Murphy (2008), Burleton (2006), Eggers and Startup (2006), and de Bettignies and Ross (2004) for arguments suggesting that it is not entirely clear that costs are lower in conventional procurement when a full evaluation of the relative costs is considered.

³³. Calculating project risk is not a simple task as such a calculation could be open to manipulation to serve some bias or particular interest. There could also simply be flaws in the methodology. That is why it is important for government bodies to be consistent and transparent about the methodology they use (Siemiatycki and Farooqi, 2012). Doing so allows for a more informed public discussion about specific projects.

Concern *P3s cost more because the private sector requires a rate of return on investment (a profit) whereas the public sector does not.*

This argument ignores the performance improvements that P3s and the profit motive offer. In principle, an effective P3 structures a contract so that the incentives for the private sector are aligned with the performance objectives of the public sector. Making the private sector's rate of return (profit) dependent on meeting these requirements is the incentive for the private-sector partner in a P3 to out-perform conventional procurement. This is one of the main reasons that we see more on-time, on-budget delivery with P3s.

Importantly, a properly structured P3 contract does not guarantee the private partner a profit. By entering a P3 contract, the private-sector partner is taking a risk that it may not see a return on investment. The potential for a private partner to lose money is actually a key feature of a P3 project. It is in the pursuit of profit that benefits such as greater efficiency and innovation are realized. If a private partner is unsatisfied with the profit they are receiving (or not receiving), governments must critically resist demands for extra compensation. However, extra compensation might be called for in circumstances where changes in public policy have had a negative impact upon the private partner's bottom line (OECD, 2012).

Finally, it is worth noting that, while the private sector undoubtedly participates in a P3 for the purpose of making a reasonable rate of return on investment, competition for the project (in the bidding process) will help to ensure that the rate of return for the consortium is in line with market rates of return.

Concern *Transaction costs—the costs of doing business—in P3s are higher than conventional procurement, making them more costly overall.*

It is often claimed that transaction costs—contracting and negotiation costs as well as costs incurred after formal contract agreement, such as those for monitoring, renegotiation, and termination—are prohibitively high in P3s and a deterrent to their use. There is little doubt that well-designed P3 contracts require many months or even years to negotiate and can be quite costly since the transactions are complex and spread over long horizons (usually multiple decades). As such, contracts must account for numerous risks and uncertainties, including changing government objectives, lack of commitment by either partner, coordination among multiple players, and so on. This places immense pressure on both sides to negotiate a contract up-front that covers contingencies (both foreseen and unforeseen) in a way that is acceptable to all direct stakeholders. Given their higher transaction costs, P3s are generally better suited for larger infrastructure projects where the fraction of transaction costs to total cost is lower.

Although transaction costs may be higher in a P3 model, these contractual issues are not all absent in conventional procurement. While the agreements are less complex to draw up and certainly less onerous to implement

and monitor, the apparently lower cost of conventional procurement methods may be deceptive because the risk analysis may be less thorough, resulting in cost overruns and project delays. Against this backdrop, P3s simply formalize the independent evaluation and scrutiny that should have been applied to procurement policies in the first place (Grimsey and Lewis, 2004: 89).

Transaction costs may decrease over time as P3 projects become more common and as governments establish specialized P3 procurement agencies and standardized procedures (Iacobacci, 2010; Istrate and Puentes, 2011). Earlier experiences with P3 projects in Canada tended to have management procedures designed exclusively for singular projects. This has an obvious disadvantage compared to a more standardized process. Notably, the UK government has recently announced reforms for standardizing both the P3 procurement procedure and contracting with the express goal of reducing transaction costs (HM Treasury, 2012).

But a broader discussion about costs must account for the drawbacks of government stewardship of projects. Opponents of P3s who claim they are more costly than conventional procurement fail to consider the various costs associated with the public sector when government delivers a project through conventional means. If properly accounted for, these costs can make conventional procurement more costly and the P3 option relatively more appealing—despite higher transaction costs.

For example, missing from their analysis of public-sector stewardship are costs related to the government's need to acquire specialized skills. Governments have long employed private-sector construction and management skills to build transportation infrastructure because these skills are usually not available in the public sector, nor should they be because of the nature of the work. Making these skills available internally requires high costs for recruiting skilled labour and purchasing specialized equipment, but such costs typically are not considered in the cost of public procurement.

Critics of P3s also overlook the costs of internal public-sector inefficiencies associated with conventional procurement. These include: excessive bureaucracy; public-sector projects that are poorly designed, executed, and managed; lack of clear objectives; lack of performance criteria; and lack of managerial discipline. Broadly speaking, “government failure” is the common term used to describe situations where the public sector has either failed to achieve objectives or made circumstances worse. In the end, taxpayers are on the hook for these failures.³⁴ When the realities of government failure are accounted for, the true cost of conventional procurement increases substantially.

34. See Clemens et al. (2007) for a review of 305 cases of government failure at the federal level alone over the period from 1992 to 2006. The total cost of these failures is estimated at between \$99 billion and \$125 billion. The study defines government failure narrowly to describe situations where the public sector incurs cost overruns, over or underpays

All costs and benefits should be considered when evaluating whether P3s provide value for money. Indeed, the benefits of P3s should be weighed against the costs of private-sector involvement. What matters is whether a project achieves a higher benefit on balance through P3 procurement. The empirical evidence cited earlier demonstrates that P3s actually do generate greater value for money than conventional procurement.

Concern *P3s diminish accountability and transparency to the public.*

A natural tension exists in a Public-Private Partnership between the private sector's desire to keep certain information confidential and the public's desire for accountability and transparency.³⁵ As Tim Gosling, writing for the Institute for Public Policy Research, explains:

A proportion of material generated during [P3] procurement will have to be withheld in order to secure the legitimate interests of both the public and private sectors. In the majority of cases this will be due to a need to keep commercially sensitive information confidential and to safeguard information provided in confidence ... Safeguarding genuinely sensitive information provided in confidence is important as it should encourage the private sector to be more open with the public sector during [P3] procurement. (Gosling, 2004: 10)

Maintaining confidentiality is particularly important in the bidding process. Otherwise the private sector's willingness to be open and provide innovative solutions and proposals would be dampened. Ultimately, a lack of confidentiality could reduce competition in the bidding process and the likelihood that the best and most qualified private-sector partner is awarded the P3 contract.

The tension between the need for confidentiality and for public accountability also exists in conventional procurement, where private bidders have the same need to safeguard certain information. Put simply, conventional procurement does not eliminate issues regarding transparency.

When it comes to P3s, governments have implemented a range of disclosure standards to help strike a balance between guarding commercial interests and maintaining acceptable standards of accountability and transparency. For example, Partnerships BC has developed disclosure practices with the goal of disclosing "as much as possible in the public interest without jeopardizing the ability of the government to generate the best value agreement for taxpayers" (Partnerships BC, 2007: 2).

benefits, fails to meet stated objectives, reports financial information inaccurately, provides services inefficiently, spends unnecessarily, or mismanages programs.

³⁵. Australasian Council of Auditors-General (1997) outlines criteria for classifying information as confidential.

In addition to disclosure practices, two key standards help ensure P3s remain accountable and transparent to the public (Murphy, 2008): (1) the Public Sector Comparator (PSC) and (2) value-for-money assessments. As section two noted, the PSC is the estimated cost of delivering a project through conventional procurement; it is refined throughout the decision-making process and used to decide whether proceeding with P3 procurement is of net benefit to taxpayers (Murphy, 2008). Deriving the PSC requires a detailed assessment of all the cost, revenue, and risk components associated with the project. This assessment requires openness about project costs and requirements, and ultimately enhances rather than diminishes transparency. More generally, the P3 model forces the public sector to develop a systematic process for defining, analyzing, and executing a project as well as consulting with various stakeholders.³⁶ As a result, the public achieves a higher standard of accountability in P3s than conventional procurement, where these processes are often non-existent.³⁷

Value-for-money assessments also help address concerns about accountability and transparency. In British Columbia and Ontario, P3s are subject to publicly available value-for-money assessments at several critical stages of the P3 process (Murphy, 2008: 109). These assessments are open to review by the provincial auditor general, which further enhances accountability in the P3 model. Moreover, transparency concerns during the operational phase of a P3 project can be satisfied through mechanisms such as public reporting of performance measures (including penalties for poor performance) and a structure for voicing public complaints (Murphy, 2008: 110).

Concern *P3s produce low-quality services.*

Some worry that P3s will produce low-quality services because they expect the private partner to cut corners and costs. In reality, P3 contracts contain mechanisms to prevent this. Indeed, the government can take measures to control the quality of service desired from the private-sector partner. The government can achieve this through effective monitoring and oversight of the private partner with the imposition of penalties when contract violations occur. For example, payment to the private sector can be withheld if standards written into the contract are not met.

Failure to provide services that meet the agreed-upon quality or quantity standards can result in immediate and harsh penalties. Such penalties may

³⁶. Siemiatycki (2007) describes how the P3 process has been formalized and documented by governments in various countries in order to achieve project objectives.

³⁷. An empirical study commissioned by Infrastructure Partnerships Australia examined 54 infrastructure projects, of which 21 were P3s and 33 were conventional procurement (Duffield and Raisbeck, 2007). Contrary to commonly held perceptions about the relative transparency of P3s, it found that P3 projects were far more transparent than conventional procurement projects, as measured by the availability of public data.

involve large deductions in availability payments to the P3 consortium. If performance is not corrected, the public partner could terminate the breached contract at terms disadvantageous to the private partner. In the extreme, the public partner could take over operations directly or hire another party.

Penalties are not just a theoretical nicety; they are actually used to enforce quality requirements. Iacobacci (2010) identifies three Canadian transportation P3s where penalties were levied: the Kicking Horse Canyon Project, the Anthony Henday Drive Southeast Leg Ring Road, and the Sea-to-Sky Highway.³⁸ Importantly, this does not imply a problem with the P3 model. Rather, penalties are an essential feature of P3s that foster better performance. On the other hand, P3s can also provide bonuses to the private partner in cases of superior performance. A well-structured P3 contract thus helps to ensure quality by punishing poor results and rewarding good results. An example of these incentives working in practice is Spain's highway system. A recent study found that Spanish P3s with safety requirements properly spelled out in the contract produced safer roads than conventional procurement (Rangel et al., 2012).

Concern *P3s result in a loss of policy flexibility for the government.*

Since P3s involve long-term contractual agreements that require the public sector to commit resources for many years in advance, there is concern that P3s may result in a loss of policy flexibility as governments get locked into contractual commitments. However, instances where previous commitments made by a government impose restrictions on forging new ones are not exclusive to P3s. Even if some policy flexibility is lost after the government enters a long-term P3 arrangement, the expectation is that public authorities would have already considered the consequences at initial stages of the procurement process when deciding whether to go the P3 route (Murphy, 2008). These considerations are absolutely critical and can avoid long-term commitments that are not in the best interest of taxpayers.

Governments can structure contingency plans to minimize the loss in policy flexibility. For example, they can protect the public's interest by carefully drafting a P3 contract to include a cancellation clause (Murphy, 2008: 114). Governments can also pay the private sector partner an acceptable compensation in order to terminate the contract and loose themselves from the obligation.

Concerns about the loss of policy flexibility seem relatively minor. A greater concern is that important infrastructure needs such as maintenance and upgrade are often set aside as low priorities by politicians in favour of

³⁸. Iacobacci (2010) identified two additional non-transportation P3s involving penalties: Britannia Mine Water Treatment Plant Project and the Abbotsford Regional Hospital and Cancer Centre.

whatever is currently popular politically. In this regard, the binding nature of a P3 agreement protects infrastructure plans from getting derailed (and upkeep ignored) by politicians pursuing their own agendas. To that end, a legally binding contract ensures that infrastructure plans are less likely to be neglected or deferred. Still, lessons from past P3s can reveal ways to improve flexibility. This subject was discussed in a recent review of P3 policy in the United Kingdom, where long experience in using P3s gave the opportunity to find new and innovative ways of improving the flexibility of P3s from the outset of the project to the end of the contract (see HM Treasury, 2012: 47–53).

Concern *P3s are risky because the private partner could go bankrupt.*

A common concern about P3s is the possibility of the private-sector partner going bankrupt. However, there is little difference between a private firm going bankrupt under a P3 contract and a major private firm in a major industry becoming insolvent. Any properly structured P3 contract has bankruptcy as an event of default, with preset steps to follow. Two cases from the past illustrate how P3 bankruptcy procedures operate: the South Bay Expressway in California and the Cross-City Tunnel in Australia.³⁹ In both cases, there was no government bailout, which means it was the investors and not the taxpayers who bore the cost. Furthermore, the road remained in operation throughout receivership and afterwards under new owners.

The key question to ask is what happens to the assets after bankruptcy is declared. For instance, is stewardship returned to the government, or can the government bring in a third party to run the operations? The answer will depend on the clauses and contingencies contained in the P3 contract, but either or both of those two options are typical. In fact, governments can stipulate that outstanding assets be transferred into their possession in the event of bankruptcy (Nicosia, 2002).

Concern *P3s result in foreign ownership of domestic infrastructure.*

In a Public-Private Partnership, the private partner is usually a consortium of international firms and for this reason some worry that foreign firms will gain control of domestic infrastructure. These concerns, however, are misplaced. Transportation infrastructure (for instance, roads and bridges) is usually confined to the geographic location in which it is built, so the infrastructure cannot be easily moved after construction is completed. Thus, there is little reason to believe that foreign firms in a P3 arrangement would behave much differently from domestic ones. As a safeguard, public-sector authorities can and do write into the contract conditions that prevent any wrongdoing by the private partner, whether foreign or local.

³⁹. The authors thank a reviewer for pointing out these examples.

In addition, a wide body of research has found that host countries generally benefit greatly from foreign business activity through increases in productivity, competition, innovation, and access to new technologies (see Harischandra et al., 2007, for a comprehensive review of this research). These effects ultimately translate into significant benefits for domestic consumers in the form of lower prices and increased choice. Domestic companies also benefit through transfers of technologies and ideas from foreign firms who typically form relationships with domestic firms that know the local market well.

Concern *P3s are a threat to public-sector workers.*

Particular groups think public-sector workers become displaced when governments turn to private-sector providers to deliver public services. This view, however, is not borne out in practice. Jurisdictions that engage the private sector to deliver public services generally require the private sector to offer employment to displaced public-sector workers on the terms and conditions outlined by existing collective agreements or employment contracts (Murphy, 2008). While such a practice is not necessarily economically efficient, Murphy (2008) notes it is standard in Ontario for P3 deals. Empirical studies provide no compelling evidence that public-sector workers would endure large job losses as a result of involving the private sector in the provision public services (for surveys of these studies, see Johnson, 2001 and Fernandez and Smith, 2006). Typically, studies have found that the overwhelming majority of affected public-sector workers were hired by the private sector, transferred to other government jobs, or retired after governments engaged the private sector. Moreover, P3 projects that create new infrastructure pose no real threat to public-sector workers since there are no public employees to be replaced.

Conclusion

Taken together, the arguments against P3s are not strong. When P3s are properly structured, they can produce benefits that outweigh the concerns and risks. In addition, greater experience with P3s is leading to innovations that reduce the disadvantages that do exist. That said, specific conditions should be in place to increase the success rate of P3s and reduce failures. The next section touches on these important conditions.

4 Conditions for successful Public-Private Partnerships

While P3s are an appealing alternative for improving the supply and provision of transportation infrastructure in Canada, they should not be thought of as a panacea. P3s can be inappropriate for some governments and for some projects. This section outlines three important conditions that should be in place in order to increase the likelihood of a successful Public-Private Partnership.

1 Project is suited to the P3 model

Not all transportation infrastructure projects are well suited for the P3 model; those that are generally have the following characteristics (no particular order):⁴⁰

- ◆ several qualified private-sector firms competing for the contract;⁴¹
- ◆ potential for innovation, particularly in design and service delivery;
- ◆ a dedicated revenue stream attached to the service provided;
- ◆ a feedback loop from pricing to service;
- ◆ synergies from bundling and assigning multiple tasks to one entity;
- ◆ potential for risk transfer to the private sector;
- ◆ expertise and skills required for the project less available in the public sector;
- ◆ clearly definable and measurable output specifications;
- ◆ a project large enough to spread out the initial cost of structuring a contract;⁴²
- ◆ flexible lead time to allow for proper contract negotiation.⁴³

40. This list is based on information in Murphy (2008), Ross (2008), and Eggers and Startup (2006). A P3 project does not need to have all the characteristics on this list to be successful, but a majority would certainly help.

41. The existence of competition among qualified firms is a particularly important precondition for the success of a P3 project (Grimsey and Lewis, 2004). Governments should therefore ensure the market is competitive before moving forward with a P3 project.

42. Most Canadian provinces have established a threshold of \$40 million in capital costs to be considered for a P3 project (PPP Canada, 2011).

43. Projects requiring short lead times are not well suited for P3 delivery. In the United Kingdom, the average time to conclude a P3 contract—that is, the time from initiating the project till the conclusion of the contract—was 27 months in 2005 (OECD, 2008: 63).

2 Clear and effective distribution of risk between the public and private sectors

A key determinant affecting the success or failure of a P3 project—and thus whether it delivers value for money—is effective distribution of risk between the public and private partners (OECD, 2008). Value for money can be achieved only if risk is allocated to the party best able to manage it. In addition, if not enough risk is transferred to the private-sector partner, then the P3 will not instill the kind of incentives needed to produce positive outcomes (Scribner, 2011). Requiring an element of private financing can in most cases improve the incentives for the private partner. In general, appropriate risk allocation means giving commercial and business risk to the private sector, regulatory risk to the public sector, and sharing additional risk. After risks are properly identified, priced, and allocated, the partners can then employ various techniques of risk management to avoid, prevent, or insure against exposure to risk.⁴⁴

3 A capable public sector

While effective risk allocation is a critical determining factor for P3 success, achieving it demands certain capabilities from the public sector, particularly in the realm of contract, risk, and project management (Murphy, 2008; OECD, 2008). Murphy argues that the success of a P3 hinges on the government's ability to deliver in three key areas. First, the government must create and maintain support for P3s within government, in the community, and in the private sector. Second, the government must provide effective project management. This requires a business plan that includes reasonable and transparent value-for-money assessments and risk analyses, as well as the specific outcomes that are desired. A key part of project management is ensuring that the public-sector partner continues to monitor the project throughout the contract. Finally, the government must have specialized expertise, independent from the political process, with a sophisticated understanding of the legal, technical, and financial aspects of P3 projects. This expertise is needed to handle highly technical aspects of the project such as risk allocation, value-for-money assessments, and contractual oversight.

Unfortunately, governments, particularly municipal governments,⁴⁵ often lack the expertise needed to structure successful P3s. Expertise in writ-

44. An example of good risk allocation can be found in British Columbia's Sea-to-Sky highway improvement project. In 2012, the provincial Auditor General investigated the project and found "that the design and construction risks were effectively allocated between the Province and the private-sector partners, and that the concession agreement, with a few exceptions, has been effectively managed" (Office of the Auditor General of British Columbia, 2012: 5).

45. For a discussion of the unique challenges facing Canadian municipalities, see PPP Canada (2011).

ing and negotiating contracts is especially lacking, which could result in poorly designed contracts. In addition, incentives that encourage the use of P3s when they are not appropriate and a lack of coordination between government agencies are potential risks when the public partner lacks sufficient capability (Istrate and Puentes, 2011). A well-structured contract is key to the success of P3s and the risk of opportunism is real, as both the public and private partners may uncover loopholes in the contract and exploit them to their advantage.

Although not a transportation project, a P3 project for the construction and maintenance of a school in Nova Scotia demonstrates the importance of having a public sector with the expertise to manage P3s. According to the Auditor General of Nova Scotia, the private partner failed to meet all requirements outlined in the P3 contract. At the time, this project was put forward by critics as an example of why P3s do not work but that was not the conclusion of the Auditor General, whose report states “[t]he absence of an appropriate system [within the Ministry of Education] to manage and monitor large complex contracts significantly increases the possibility that services paid for are not received and important contract terms are not complied with” (Office of the Auditor General of Nova Scotia, 2010: 20). A properly structured P3 contract would have included better mechanisms to ensure that the terms of the contract were being met.

Critics of Public-Private Partnerships also cite the Academic Ambulatory Care Centre project in British Columbia because the actual construction cost was higher than originally budgeted. The higher cost resulted from public-sector deficiencies, however, not the P3 model itself. British Columbia’s Auditor General found that the public-sector partner had not adequately assessed the requirements of the structure’s users (Office of the Auditor General of British Columbia, 2011). As a result, design features costing an additional \$11 million had to be added after the project began.⁴⁶ It is important for the public-sector partner to understand and clearly define what outcomes are required before work starts on the project. Otherwise, the private partner will be unable to control costs and a key advantage for the P3 model is lost.

It is possible to overcome these challenges through a robust P3 model for which there are good examples to draw upon from around the world. A robust P3 model is founded on the following building blocks (Burleton, 2006; Murphy, 2008):

- ◆ a standardized assessment and selection process;
- ◆ high levels of expertise across the public sector;
- ◆ an open, transparent, and accountable environment;
- ◆ and a strong commitment to the process.

⁴⁶. There was an additional increase to the estimated cost of \$17 million. The Auditor General explained that this was not due to any project failings but the result of a lower discount rate in later cost estimates.

To ensure the public sector has the necessary capacity to properly construct, monitor, and deliver P3 contracts, governments have created specialized agencies to deal with P3s. These agencies are called “P3 units”, which the OECD defines “as any organization set up with full or partial aid of the government to ensure that necessary capacity to create, support, and evaluate multiple public-private partnership agreements is made available and clustered together within government” (OECD, 2010: 28). P3 units perform several important functions, including standardizing the procurement process, offering advice and expertise to public-sector agencies considering P3s, and coordinating between government agencies (Istrate and Puentes, 2011). The existence of P3 units also serves to reveal a strong commitment on the part of the government towards the P3 procurement process. P3 units have often been founded specifically to deal with issues or defects discovered in earlier P3 projects. For example, the Portuguese P3 unit was created in 2003 because of the poor performances of past P3s (OECD, 2010).

The first specialized P3 unit in Canada emerged at the provincial level in British Columbia in 2002. By adopting best practices from around the world, Partnerships BC has helped set the foundation to deliver successful P3s in the province. Quebec followed British Columbia’s example by establishing PPP Quebec in 2005, as did Ontario in 2006, when it set up Infrastructure Ontario. Since then the use of provincial P3 units has grown. Partnership New Brunswick was established in 2010 and in October 2012 the government of Saskatchewan announced the creation of a new Crown corporation called SaskBuilds to handle the province’s infrastructure expansion and act as a P3 unit (Government of Saskatchewan, 2012). In addition, Alberta has a P3 unit called the Alternative Capital Financing Office that operates within the province’s Treasury Board (OECD, 2010) and Nova Scotia has created its own special office to provide advice on P3s (Gross et al., 2010). Finally, the federal government established PPP Canada in 2009, a national P3 unit to improve P3 expertise, encourage the development of Canada’s P3 market on a national level, and to manage the federal government’s \$1.25 billion fund for P3 projects.⁴⁷

Canada’s P3 units have received international acknowledgement. A recent review of P3s in the United Kingdom pointed to Canadian P3 units as a model for reducing transaction costs (HM Treasury, 2012). This is despite the longer history and the greater use of P3 projects in the United Kingdom.

47. Details on the P3 Canada Fund can be found at <<http://www.p3canada.ca/p3-canada-fund-overview.php>>. Moreover, the federal government’s 2013 budget contained proposals to increase the consideration and use of P3s for delivering infrastructure projects (see Canada, Ministry of Finance, 2013).

Profile of Partnerships BC

The government of British Columbia demonstrated commitment to the P3 approach when, in 2002, it established Partnerships BC, an arm's length organization with a high level of expertise "responsible for bringing together ministries, agencies, and the private sector to develop projects through public-private partnerships" (Partnerships BC, 2006). Since the creation of Partnerships BC, the province has delivered between 10% and 20% of all new public infrastructure through P3s (Burlington, 2006; Eggers and Startup, 2006). Due to its success, the BC model has drawn interest from other provinces.

Modeled after Partnerships UK,⁴⁸ Partnerships BC works closely with the public sector throughout the procurement process. It plays a supporting role at the following junctures: the initial assessment of whether a P3 is the appropriate option, the development of a business plan, the approval stage, and the implementation phase (Burlington, 2006). The public-sector agencies that Partnership BC works with include ministries, Crown corporations, and local government (OECD, 2010). By instilling a framework of standardized procedures and guidelines, Partnerships BC has expedited and brought structure to the P3 procurement process in the province.

Learning from past mistakes

If the conditions discussed above—a project suited to the P3 model, effective allocation of risk, and a capable public sector—are not met, then the P3 model is most likely not the best option for that project. Opponents of P3s nonetheless point to specific cases in which a P3 project failed and then apply that result to all P3s. Certain projects may fail because they are missing a key condition for success. The failure of one project does not mean that all P3 projects are also doomed to failure. Failed projects do, however, offer an opportunity to learn from past mistakes.

Over the past decades, understanding of P3s has evolved. The United Kingdom has recently undertaken a review process to evaluate P3s that use private financing. They identified five conditions that have led to failed P3 projects in the United Kingdom (HM Treasury, 2012). These lessons can be generalized to say that a P3 model should not be used where:

⁴⁸. Partnerships UK was established in 2000 as a permanent centre of excellence to increase private participation in the provision of public services (in the United Kingdom, P3s are referred to as Private Finance Initiatives or PFIs). The United Kingdom's P3 model has spread around the world, including to Australia, which was an early adopter and is now emerging as a global P3 leader. Large players in the P3 market also include Korea, Portugal, and Spain (OECD, 2008).

- ◆ the transaction costs are disproportionate to the value of the project;
- ◆ there are fast-paced technological changes that make it difficult to establish long-term service requirements;
- ◆ the nature of the services being delivered does not allow the public sector to define clearly its need over the long term;
- ◆ insufficient attention is paid to projecting future demand; and
- ◆ projects are moving forward, not on the basis of a genuine comparison of the options, but because of artificial incentives established by public policy.⁴⁹

The United Kingdom is not the only country that has learned from its experiences with P3s; Canadian governments are also gaining a more sophisticated understanding of where and when to use P3s and how to manage them. Iacobacci (2010) draws a distinction between the “first wave” and the “second wave” of P3s in Canada (those reaching financial close from 2004 onward). He justifies this distinction by pointing out important differences between early and later projects in terms of quality and the importance of the value-for-money assessment as well as the motivations for selecting P3s. The second wave of projects represents an improved process and, therefore, a greater chance of success.

Ontario is an example of where improvements in P3 procurement have been made. This is illustrated by two reports by Ontario’s Auditor General (OAG). In 2008, the OAG looked into the Brampton Civic Hospital P3 project and concluded that there were several problems with the procurement process, in particular with the way that the P3 project was compared to the conventional procurement option. The OAG noted that the Brampton Civic Hospital was a pilot program and the ministry was already taking actions to correct the procedures (Ontario Auditor General, 2008). In a follow-up report in 2010, the OAG found that many of the 2008 recommendations had been “substantially implemented” and the process had been improved (Ontario Auditor General, 2010). Ontario was able to learn from the mistakes of the Brampton Civic Hospital project and improve later P3 procurements. As experience with, and understanding of, P3s increase, the ability to identify when the P3 model has potential and how to tap that potential should also improve.

⁴⁹. For instance, the United Kingdom used to provide a “PFI Credit” to encourage the use of P3s by public-sector agencies. This credit was eliminated in 2010.

5 Measuring the extent of transportation Public-Private Partnerships in Canada

Since it is clear that Public-Private Partnerships have the potential to improve the design, construction, and operation of transportation infrastructure, it is useful to know to what extent transportation P3s are already used in Canada. The data analysis begins by comparing Canada's use of transportation P3s to that of other industrialized countries. It then looks at the use of transportation P3s within Canada and the provinces and territories in which they are located.⁵⁰

Use of transportation P3s in Canada and other countries

Table 2 presents data on the number and cost of transportation P3s from 1985 to 2013 (as of January 30) for 32 countries belonging to the Organisation for Economic Co-operation and Development (OECD) including Canada.⁵¹ The total number of projects and the cost are cumulative over the period. Also the projects are either completed, underway, or in the planning stage,⁵² and the costs are in nominal US dollars, meaning they are not adjusted for inflation.

From 1985 to 2013 (as of January 30), Canada engaged in 59.5 transportation P3s totalling approximately US\$44.4 billions (table 2).⁵³ By comparison, the United States engaged in 272.5 transportation P3s over the same period, amounting to US\$201.9 billions (table 2). Clearly, the United States was

50. This section uses data purchased from Public Works Financing's International Major Projects Database. For details on the data source, see Appendix B.

51. 1985 is the earliest year for which PWF (2013) provides data on international P3s. Data for Luxembourg and Switzerland are not available.

52. Since the data include planned projects, it is possible that some projects may have been cancelled. The information on planned projects is current to January 30, 2013.

53. The reason some countries have 0.5 of a project is that some projects are shared between countries. In these instances, the number and cost of the transportation P3 project was split equally between the two countries.

more active in the use of transportation P3s than Canada during the period, both in terms of sheer number and cost. But this is unsurprising, given that the United States is a larger country with a bigger economy and population.

A more meaningful comparison of the extent to which transportation P3s are used in Canada and the United States, and indeed other countries, requires an adjustment of the data to account for the various sizes of the countries. Unfortunately, given the nature of the data from PWF (2013), this cannot be done in a way that would be meaningful. Two ways to account for differences in the size of countries is by adjusting for either population or the size of the economy (GDP). Because the number and costs of P3 projects are cumulative, this would not be a useful method as it does not make good methodological sense to compare the cumulative cost of nearly 30 years of activity to a single year's population or GDP, particularly since the costs are in nominal dollars and cannot be adjusted for inflation since project costs are incurred over several years and updated over time. Table 2 should be viewed as giving only a rough idea of where the OECD countries stand in terms of their use of transportation P3s. Overall, Canada has the sixth highest number of transportation P3s and on a cost basis it ranks ninth.⁵⁴

Due to the controversy around classifying Design-Build (DB) models as a P3 type, the authors recalculated the number of P3s in each country excluding DB projects. According to the PWF database, the four countries that use transportation DBs the most are the United States (85), Canada (4), South Korea (3), and Portugal (3). The remaining countries had between zero and three DB transportation projects within the time-span of the database. Once DBs were removed there were no major changes in the country rankings in table 2.⁵⁵ If we excluded transportation DBs, Canada would rank seventh in terms of number of transportation P3s and tenth for cost.

Use of transportation P3s in Canada

Table 3 shows the breakdown of Canadian transportation projects by status. Of the 59.5 projects, 43 (just under three quarters) have the status of being either completed or underway. In terms of cost, these 43 projects sum to over US\$30.6 billions, about 69.0% of the total. The remaining 16.5 projects are in the planning stage or are on hold⁵⁶ and have not reached financial close. The

⁵⁴. The authors also calculated Canada's overall ranking on all P3s (including transportation, water, buildings, and others). Canada ranks fourth overall both on the number of projects and total project costs. The reason for the higher ranking is that Canada has a disproportionately higher number of P3s for buildings than other countries.

⁵⁵. No country moved up or down in the rankings by more than three spots on either the number or cost.

⁵⁶. PWF (2013) does not distinguish between projects in planning stage and those on hold.

Table 2: Cumulative number and cost of transportation P3s, by OECD country (1985–2013, as of Jan. 30)

	Number of projects	Rank (of 32)	Cost (US\$ millions)	Rank (of 32)
United States	272.5	1	201,855	1
United Kingdom	97	3	129,818	2
Italy	34.5	11	93,339	3
France	44.5	10	68,254	4
Spain	158.5	2	66,441	5
South Korea	48	8	58,520	6
Portugal	45	9	51,865	7
Australia	57	7	46,799	8
Canada	59.5	6	44,422	9
Mexico	82	4	44,266	10
Japan	5	24	31,838	11
Greece	18	16	26,994	12
Turkey	19.5	14	24,932	13
Chile	64	5	18,290	14
Netherlands	18	16	16,459	15
Poland	19	15	10,995	16
Ireland	26	12	10,531	17
Austria	6.5	22	9,839	18
Germany	25	13	9,590	19
Denmark	4.5	28	8,286	20
Belgium	16	18	6,947	21
Israel	10	19	6,845	22
Hungary	9	20	5,255	23
Czech Republic	6	23	5,159	24
Sweden	8.5	21	3,104	25
Slovakia	5	24	3,000	26
Finland	5	24	1,850	27
Norway	5	24	1,416	28
New Zealand	3	29	348	29
Iceland	1	30	70	30
Estonia	1	30	58	31
Slovenia	0	32	0	32
Total	1,174		1,007,384	

Source: Public Works Financing [PWF] (2013); calculations by the authors.

Notes: [1] This list includes transportation P3 projects that are completed, underway, or planned. [2] PWF (2013) does not remove projects from its database that have been put on hold until they have been on hold for 10 years, so some projects included are inactive or on hold. [3] Some projects in PWF's database are still early in the planning stage and do not have final approval. [4] Transportation P3s include motorways, bridges, tunnels, seaports, and airports. [5] Data for Luxembourg and Switzerland were not available in PWF (2013). [6] PWF (2013) lists project costs in nominal US dollars. Costs quoted in local currencies are converted at the dollar exchange rate at the time estimates are made, fixed-price contracts are signed, or completion costs are set. Costs are generally updated over time as projects move through planning, procurement, and construction phases. [7] PWF (2013) does not provide a cost for every project in its database, so the totals in some cases are understated. [8] Some projects are joint between countries. In such cases, the projects (and costs) were split equally. This is why some project number tallies include 0.5. These projects are: three joint road projects between Canada and the US (total cost of US\$3,160 millions); a joint road project between Austria and Italy (total cost of US\$8,500 millions); a joint rail project between France and Spain (total cost of US\$1,400 millions); a joint rail project between Turkey and Georgia (total cost of US\$700 millions; figures for Georgia are not shown in this table because it is not an OECD country); a joint road project between Denmark and Sweden (total cost of US\$2,700 millions). [9] Figures for UK include P3 projects in Northern Ireland; these are recorded separately by PWF (2013). [10] According to PWF (2013), there are no Slovenian transportation P3 projects.

Table 3: Cumulative number and cost of Canadian transportation P3s, by status (1985 –2013, as of Jan. 30)

	Number of projects	Percentage of total	Cost (US\$ millions)	Percentage of total
Completed or underway	43.0	72.3%	30,644	69.0%
Planned or on hold	16.5	27.7%	13,778	31.0%
Total	59.5	100.0%	44,422	100.0%

Source: PWF (2013); calculations by the authors

Notes: [1] PWF (2013) does not distinguish between projects that are being planned or on hold. [2] PWF (2013) does not remove projects from its database that have been put on hold until they have been on hold for 10 years, so some projects included are inactive or on hold. [3] PWF (2013) lists project costs in nominal US dollars. Costs quoted in local currencies are converted at the dollar exchange rate at the time estimates are made, fixed-price contracts are signed, or completion costs are set. Costs are generally updated over time as projects move through planning, procurement, and construction phases. [4] PWF (2013) does not provide a cost for every project in its database, so the totals in some cases are understated. [5] Three projects that are joint with the United States are counted as half for both the number of projects and the cost. [6] Some projects in PWF's database are still early in the planning stage and do not have final approval.

reported cost of the projects either planned or on hold is US\$13.8 billions, but this total excludes five projects whose costs were not available at the time of writing.⁵⁷ Thus, the total cost of planned projects is understated.

Table 4 presents a breakdown of the number and cost of Canadian transportation P3s over the period from 1985 to 2013 (as of January 30) by type of transportation. The table shows that road transportation P3s formed the largest proportion of the total over the period both in terms of number and cost: 39.5 of 59.5 transportation projects, approximately two thirds, were for roads. The value of these is US\$29.9 billions, or a little more than two thirds of the total. Following roads, most transportation P3s were in the rail category.

Examining the data on Canadian transportation P3s highlights two notable trends.⁵⁸ First, the number of transportation P3s is increasing over time. Of the 43 projects completed or underway between 1985 and 2013 (as of January 30), 31 (72.1%) had contracts with award dates in the last ten years (2003 or later). In addition to the 43 projects already completed or underway, there are 16.5 planned projects. This means that 47.5 projects or nearly 80% of the total has been or likely will be built after 2002.

⁵⁷. The five projects lacking information about cost include the Deh Cho Bridge in the Northwest Territories, which has been cancelled (see Appendix A). There are three in Ontario: the GO Transit East Rail Maintenance Facility, TTC Eglinton and Scarborough Light Rail System, and the Hamilton Light Rail. Fifth is the Quebec highway service areas.
⁵⁸. See Appendix A for a list of Canadian transportation P3 projects, the year the contracts were awarded, the cost and location of each project, and the type of P3 model used for each project.

Table 4: Cumulative number and cost of Canadian transportation P3s, by type of transportation, (1985–2013, as of Jan. 30)

	Number of projects	Percentage of total	Cost (US\$ millions)	Percentage of total
Road	39.5	66.4%	29,892	67.3%
Rail	14	23.5%	11,415	25.7%
Airport	5	8.4%	2,915	6.6%
Seaport	1	1.7%	200	0.5%
Total	59.5	100.0%	44,422	100.0%

Source: PWF (2013); calculations by the authors.

Notes: [1] This list includes transportation P3 projects that are completed, underway, or planned. [2] PWF (2013) does not remove projects from its database that have been put on hold until they have been on hold for 10 years, so some projects included are inactive or on hold. [3] Some projects in PWF's database are still early in the planning stage and do not have final approval. [4] PWF (2013) lists project costs in nominal US dollars. Costs quoted in local currencies are converted at the dollar exchange rate at the time estimates are made, fixed-price contracts are signed, or completion costs are set. Costs are generally updated over time as projects move through planning, procurement, and construction phases. [5] PWF (2013) does not provide a cost for every project in its database, so the totals in some cases are understated. [6] Figures for road transportation P3s include bridges and tunnels. [7] Three projects that are joint with the United States are counted as half for both the number of projects and the cost.

A second noteworthy trend is that the majority of Canadian P3s in the transportation sector use P3 models that involve private-sector financing: 31 of 43 projects that are completed or underway (72.1%) involve some private-sector financing. The combined cost of these 31 projects equals US\$21.8 billions, which represents 71.3% of the total cost of completed projects. With respect to the planned P3 projects, the type of P3 model has been specified in nine of them and all but one are expected to include private-sector financing.

Transportation P3s in the provinces and territories

Table 5 presents a detailed breakdown of the 59.5 Canadian transportation Public-Private Partnerships, with the number and cost of projects classified by status and location. This breakdown leads to some interesting observations. At least one transportation P3 has been completed or was underway or planned in eight of 10 provinces between 1985 and 2013 (as of January 30). The two provinces of Saskatchewan and Newfoundland & Labrador are the outliers, with no projects planned, completed, or underway. Yukon is the only territory without a transportation P3.

Table 5 has a problem similar to that in table 2 in that the sizes of the Canadian provinces vary greatly. This makes the table less meaningful in describing how each province stands relative to the others in terms of the use

Table 5: Cumulative number and cost of Canadian transportation P3s, by status and location (1985–2013, as of Jan. 30)

	Completed or underway		Planned		Total	
	Number of projects	Cost (US\$ millions)	Number of projects	Cost (US\$ millions)	Number of projects	Cost (US\$ millions)
Ontario	11	9,925	8.5	5,324	19.5	15,249
British Columbia	15	9,726	1	29	16	9,755
Quebec	3	2,261	2	4,920	5	7,181
Alberta	5	4,913	1	1,750	6	6,663
New Brunswick	3.5	1,935	1	925	4.5	2,860
“National”	1	1,100	0	0	1	1,100
Nunavut	0	0	1	580	1	580
Prince Edward Island	0.5	365	0	0	0.5	365
Nova Scotia	1	114	1	250	2	364
Manitoba	3	305	0	0	3	305
Northwest Territories	0	0	1	n/a	1	n/a
Yukon	0	0	0	0	0	0
Saskatchewan	0	0	0	0	0	0
Newfoundland & Labrador	0	0	0	0	0	0
Total	43.0	30,644	16.5	13,778	59.5	44,422

Source: PWF (2013); calculations by the authors.

Notes: [1] PWF (2013) does not remove projects from its database that have been put on hold until they have been on hold for 10 years, so some projects included are inactive or on hold. [2] Some projects in PWF’s database are still early in the planning stage and do not have final approval. [3] PWF (2013) lists project costs in nominal US dollars. Costs quoted in local currencies are converted at the dollar exchange rate at the time estimates are made, fixed-price contracts are signed, or completion costs are set. Costs are generally updated over time as projects move through planning, procurement, and construction phases. [4] PWF (2013) does not provide a cost for every project in its database, so the totals in some cases are understated. [5] Three projects that are joint with the United States are counted as half for both the number of projects and the cost. [6] The Confederation Bridge project links New Brunswick and Prince Edward Island and is split equally between the provinces. [7] The transfer of air navigation to a private entity was a national policy without a particular location. For the purpose of this table, its location was categorized as “national”. [8] The Deh Cho Bridge in the Northwest Territories is included in PWF (2013) but the government of the Territories has decided to use conventional procurement instead of a P3 model.

of P3s. Unfortunately, as was the case for table 2, there is no methodologically acceptable adjustment that is readily available. However, table 5 does give a rough idea of where P3s are being used in Canada.

Table 5 suggests that the number and cost of Canadian transportation P3s vary dramatically by provincial and territorial location. Notably, the majority of projects are concentrated in two provinces: British Columbia and Ontario. In fact, 26 of 43 projects that are completed or underway (60.5%) are located in British Columbia and Ontario. The combined value of these P3 projects amounts to roughly US\$19.7 billions—64.1% of the Canadian total.

It is unsurprising that Canadian transportation P3s are concentrated in British Columbia and Ontario, as these provinces took steps early on to promote P3 markets in their jurisdictions, in part through the creation of Partnerships BC and Infrastructure Ontario—organizations dedicated to expanding the use of P3s in the provinces. However, other provinces are following suit with establishment of their own provincial P3 units, which may shift the locational distribution of P3s in Canada over time.

Conclusion

To recap, the data analysis in this section revealed the following insights about the use of transportation P3s in Canada.

- ◆ Cumulatively, Canada has planned, underway, or completed the sixth greatest number of transportation P3 projects in the OECD from 1985 to 2013 (as of Jan. 30). On a cost basis, Canada's cumulative transportation P3s total ninth highest.
- ◆ Of the various types of transportation, including roads, rail, airports, and seaports, transportation P3s in Canada are most concentrated in roads, both in terms of number and cost.
- ◆ The number of transportation P3s undertaken in Canada is increasing over time.
- ◆ Most Canadian transportation P3s use a model that involves some private-sector financing.
- ◆ The majority of Canadian transportation P3s is concentrated in two provinces, British Columbia and Ontario.

Conclusion

This study examined the potential for Public-Private Partnerships (P3s) to improve the supply and provision of transportation infrastructure in Canada. It found that P3s are an important alternative to conventional procurement for delivering infrastructure services since P3s have distinct features that can drive benefits.

The drivers of P3 benefits

- ◆ increased risk sharing with the private sector;
- ◆ improved incentives because the private-sector partner performs multiple tasks that have conventionally been performed by separate entities;
- ◆ private financing and the incentive from having “skin in the game”;
- ◆ specialized expertise and production offered by the private-sector;
- ◆ competition for the provision of services throughout the project’s life;
- ◆ performance-based contracts.

Benefits of Public-Private Partnerships

- ◆ better performance in the construction phase through on-time and on-budget delivery;
- ◆ greater value for money expected over the project’s life cycle;
- ◆ improvements in customer service;
- ◆ increased scope for innovation in infrastructure delivery;
- ◆ improved care of public infrastructure assets;
- ◆ a government more focused on transportation outcomes such as the level and quality of outputs.

Concerns about P3s

While the potential benefits of P3s are significant, there have been criticisms and concerns by their opponents. Many of these concerns are unwarranted. For example, concerns about diminished accountability and transparency ignore the fact that a range of disclosure standards are available to strike a balance between guarding the private sector's commercial interests and maintaining standards of public accountability and transparency. Indeed, P3s may even be more transparent and accountable than conventional procurement.

Other concerns, such as those about high transaction costs, have more force but these costs should be weighed against the benefits in the decision-making process. Many concerns, however, will likely diminish over time as improved expertise and experience with P3s leads to innovative solutions.

Conditions for successful P3s

This study does not suggest that P3s are a panacea for Canada's transportation infrastructure problems. There are certain conditions that should be in place to increase the likelihood of successful Public-Private Partnerships. First, the project must be amenable to the P3 model. Second, the contract must have a clear and effective distribution of risk between the public and private sectors. Finally, achieving this effective risk allocation requires particular expertise from the public sector that it typically does not have. Thus, P3s should be used selectively and employed with proper care and attention on the part of government. Rather than blindly encourage the adoption of P3s, governments should focus on establishing a framework in which P3 projects have the ability to succeed and create value for money.

P3s have tremendous potential for improving the provision of public transportation infrastructure in Canada. While certain provinces have made critical headway, more widespread adoption could improve the supply and provision of transportation infrastructure across the country. Canadian governments should therefore continue to look to Public-Private Partnerships as an option as they seek ways to address the country's transportation infrastructure challenges.

Appendix A: Information on individual Canadian transportation P3s from 1985 to 2013 (as of Jan. 30)

Year awarded	Project	Type	Location	Cost (US\$ m.)	P3 model
1991	Toronto Pearson International Airport, Terminal 3	Airport	Ontario	650	FB
n/a	Vancouver International Airport	Airport	British Columbia	560	OM
1993	Confederation Bridge	Road	Prince Edward Island / New Brunswick	730	DBFOM
1994	Charleswood Bridge	Road	Manitoba	10	DBFM
1995	Highway 104 Cobequid Pass	Road	Nova Scotia	114	DBFO
1996	Transfer of Federal Air Navigation Services to NAV Canada	Airport	National	1,100	OM
1996	Hamilton-Wentworth Airport	Airport	Ontario	25	OM
n/a	Red Hill Creek Expressway	Road	Ontario	50	DB
n/a	Westview Interchange (Trans Canada Highway)	Road	British Columbia	35	DB
1998	Fredericton to Moncton Highway	Road	New Brunswick	605	DBFOM
1999	Highway 407 ETR	Road	Ontario	3,600	OM
2002	York Rapid Transit System (Viva)	Rail	Ontario	175	DBFOM
2003	Transfer of BC Freight Rail to CN Railway	Rail	British Columbia	600	OM
2004	Anthony Henday Drive Southeast	Road	Alberta	493	DBFO
2004	Sierra Yoyo Desan Upgrade	Road	British Columbia	40	DBFO

Year awarded	Project	Type	Location	Cost (US\$ m.)	P3 model
2004	Canada Line (RAV Link)	Rail	British Columbia	1,900	DBFOM
2005	William R. Bennett (Okanagan Lake) Bridge	Road	British Columbia	145	DBFO
2005	Golden Ears Bridge	Road	British Columbia	810	DBFOM
2005	Kicking Horse Canyon Pass, Phase 2	Road	British Columbia	130	DBFOM
2005	Sea-to-Sky Highway	Road	British Columbia	600	DBFOM
2005	Trans-Canada Highway (New Brunswick)	Road	New Brunswick	465	DBFOM
2006	Golden Ears Bridge Toll Collection System	Road	British Columbia	50	DBOM
2007	Stoney Trail Northeast (Calgary Ring Road)	Road	Alberta	555	DBFOM
2007	Autoroute 25	Road	Quebec	538	DBFOM
n/a	Prince Rupert Fairview Container Terminal	Seaport	British Columbia	200	OM
2008	Edmonton Ring Road, Northwest Anthony Henday	Road	Alberta	1,300	DBFOM
2008	Quebec Service Areas	Road	Quebec	n/a	DBFOM
2008	Autoroute 30	Road	Quebec	1,723	DBFOM
2009	Port Mann Bridge	Road	British Columbia	2,460	DB
2009	Highway Service Centres	Road	Ontario	300	DBFOM
2010	Disraeli Bridges	Road	Manitoba	195	DBFM
2010	Chief Peguis Trail Extension	Road	Manitoba	100	DBFM
2010	Windsor-Essex Parkway	Road	Ontario	1,350	DBFM
2010	Stoney Trail Southeast (Calgary Ring Road)	Road	Alberta	765	DBFOM
2010	South Fraser Perimeter Road	Road	British Columbia	696	DBFOM
2010	Route 1 Gateway Project	Road	New Brunswick	500	DBFOM

Year awarded	Project	Type	Location	Cost (US\$ m.)	P3 model
2011	Highway 407 East Extension Electronic Tolling and Billing	Road	Ontario	25	DB
2011	Pearson Airport Rail Link	Rail	Ontario	250	DBF
2012	Evergreen Line	Rail	British Columbia	1,400	DBF
2012	Confederation Line Light Rail Project	Rail	Ontario	1,500	DBFM
2012	Highway 407 ETR East Extension	Road	Ontario	2,000	DBFM
2012	Anthony Henday Drive Northeast	Road	Alberta	1,800	DBFO
2012	Port Mann Bridge Tolling	Road	British Columbia	100	Operate
n/a	Deh Cho Bridge	Road	Northwest Territories	n/a	n/a
Planned	Ambassador Bridge Replacement	Road	Ontario	300	BOO
Planned	Yukon River Bridge	Road	British Columbia	29	DBFM
Planned	GO Transit East Rail Maintenance Facility	Rail	Ontario	n/a	DBFM
Planned	TTC Sheppard East Maintenance and Storage Facility	Rail	Ontario	400	DBFM
Planned	TTC Eglinton and Scarborough Light Rail System	Rail	Ontario	n/a	DBFM
Planned	Iqaluit International Airport	Airport	Nunavut	580	DBFOM
Planned	Waterloo LRT, Stage 1	Rail	Ontario	820	DBFOM
Planned	Detroit River International Crossing to Windsor	Road	Ontario	1,130	DBFOM
Planned	Lachine Rail Maintenance Facility	Rail	Quebec	120	DBFOM
Planned	Alberta, Edmonton Southeast to West LRT	Rail	Alberta	1,750	n/a
Planned	Route 11, Moncton and Miramichi	Road	New Brunswick	925	n/a
Planned	Highway 104 Twinning	Road	Nova Scotia	250	n/a
Planned	Toronto Subway Extension / Spadina Line (VivaNext)	Rail	Ontario	2,500	n/a

Year awarded	Project	Type	Location	Cost (US\$ m.)	P3 model
Planned	Hamilton Light Rail	Rail	Ontario	n/a	n/a
Planned	New York-Niagara River Bridge	Road	Ontario	150	n/a
Planned	Cataraqui River, Third Crossing	Road	Ontario	24	n/a
Planned	St. Lawrence River Bridge	Road	Quebec	4,800	n/a

Source: PWF (2013).

Notes

[1] This list includes transportation P3 projects that are completed, underway, or planned. Those in the planning stage have “planned” as their contract award year.

[2] PWF (2013) does not remove projects from its database that have been put on hold until they have been on hold for 10 years, so some projects included are inactive or on hold.

[3] Some projects in PWF’s database are still early in the planning stage and do not have final approval.

[4] PWF (2013) does not provide an award date for every project. These projects are marked “n/a”.

[5] Bridges and tunnels are counted as roads due to ambiguity in the distinction between bridges, tunnels, and roads within PWF (2013).

[6] PWF (2013) lists project costs in nominal US dollars. Costs quoted in local currencies are converted at the dollar exchange rate at the time estimates are made, fixed-price contracts are signed, or completion costs are set. Costs are generally updated over time as projects move through planning, procurement, and construction phases.

[7] PWF (2013) does not provide a cost for every project in its database.

[8] The legend for the types of P3 models is as follows: DB = Design-Build; DBFO = Design-Build-Finance-Operate; DBFOM = Design-Build-Finance-Operate-Maintain; DBOM = Design-Build-Operate-Maintain; BOT = Build-Operate-Transfer; BOO = Build-Own-Operate; DBFM = Design-Build-Finance-Maintain; DBF = Design-Build-Finance; FB = Finance-Build; OM = Operate-Maintain; n/a = contract type yet to be determined.

[9] In the PWF (2013) database, some P3 models are referred to as “leases” or “asset sales”. After a conversation with the database manager, the authors have reclassified these projects as “OM” (Operate-Maintain). This provides clarity while still accurately reflecting the classification of PWF (2013).

[10] The authors used CCPPP (2013b) to confirm the P3 model for each type. Several of the projects that are in PWF (2013) are not in CCPPP (2013b). Among those that are, only four were different in CCPPP (2013b). According to CCPPP (2013b), Highway 407 ETR = DBFOM; Windsor-Essex Parkway = DBFM; Canadian Line Light Rail Project = DBFM; and Anthony Henday Drive Northeast = DBFO.

[11] The Confederation Bridge project links New Brunswick and Prince Edward Island and is split equally between the provinces.

[12] The Deh Cho Bridge in the Northwest Territories is included in PWF (2013) but the territory has decided to use conventional procurement instead of a P3 model. The project remains listed as a P3 in the PWF database because projects are not removed until they have been on hold for 10 years.

[13] PWF (2013) refers to the Ambassador Bridge as a BOO (Build-Operate-Own), a procurement process in which the private entity retains ownership at the end of the contract. It is not clear to the authors how BOO differs from privatization but it is included here because it is part of the PWF (2013) database.

[14] Three projects at a total cost of US\$3,160 millions were split equally between the United States and Canada because they are located in both countries. This table shows only the Canadian half of the cost for these projects, which are the Ambassador Bridge Replacement, New York-Niagara River Bridge, and Detroit River International Crossing.

Appendix B: A description of PWF's International Major Projects Database

The source of the P3 data used in this study is Public Works Financing (PWF), which is a monthly industry publication that focuses on P3-related news and issues. PWF maintains the International Major Projects Database, an online subscription database that includes over 100 countries and more than 3,500 projects. The database is an ongoing project that is updated weekly. For sources it uses reports from P3 developers, governments, company websites, and the PWF's editor and correspondents. The database is available for purchase by contacting PWF directly.

The categories of Public-Private Partnerships (P3s) that it uses are: transportation, water and wastewater management, and building facilities. The focus of this report is on transportation, so this was the only category for which we presented data. Subcategories of transportation include: seaport, rail, motorway, toll motorway, toll bridge, and toll tunnel. Airports are not counted under the transportation category by the database but the authors decided that it would be appropriate to include airport projects as an additional subcategory. Motorway, toll motorway, toll bridge, and toll tunnel were all combined into one subcategory referred to as "road." This is for the sake of keeping tables concise and because the database does not always accurately distinguish motorways from bridges or tunnels.

Public Works Financing adopts the definition of Public-Private Partnerships used by the office of the British Private Finance Initiative (PFI) (see PWF, 2008: 6). The definition is broad and includes any of the following three types of long-term arrangements:

- 1** the introduction of private-sector ownership, full or partial, into state-owned enterprises;
- 2** Arrangements where the public sector contracts to purchase quality services on a long-term basis to take advantage of the private sector's management skills working under the incentive provided by having its own finance at risk; such arrangements include concessions and franchises,

where a private-sector partner takes on the responsibility for providing a public service, including maintaining, enhancing, or constructing the necessary infrastructure;

- 3 selling government services into wider markets, and other partnership arrangements where private-sector expertise and finance are used to exploit the commercial potential of government assets.

By this definition, PWF appears to classify privatizations as P3s. But a conversation with the database's manager, William Reinhardt, revealed that pure privatizations are typically not counted as P3s. However, in particular instances a transfer of a public asset to private ownership could be counted as a P3. These instances occur when an on-going relationship is maintained between the two sectors after the sale of an asset. Since there continues to be an ongoing relationship between the public and private sectors, these deals are counted as a P3 in PWF's database. In some instances, the authors disagree with PWF's classification of projects as P3s but to ensure consistency in the data they did not alter the classification system.

Due to the fact that the database is regularly updated, the authors took steps to ensure that the data used for this report project was consistent at a specific point in time. The authors printed out and saved electronic copies of the relevant aspects of the database on January 30, 2013. The current PWF database will not perfectly match the database used for the report. Those who are interested in replicating the empirical results of this report are encouraged to contact the authors. It should be noted that PWF's database is meant for the use of industry members.

One important shortcoming of PWF's database is the way in which project costs are reported. Costs are reported in nominal US dollars, which mean they are not adjusted for inflation. As a result, this understates the real value of P3s. Another important shortcoming is that the database has been continually updated over the course of several years and by several individuals. This has led to some inconsistencies in how the data is labelled and the use of outdated terminology. The managers of the database were contacted in cases where the meaning of labels was unclear.

While the PWF database is not perfect, it is the most comprehensive of its kind on worldwide P3 projects. At minimum, the data is a useful guide for roughly gauging the extent of Canada's use of P3s in an international context.

References

Andersen A., & Enterprise LSE (2000). *Value for Money Drivers in Private Finance Initiative*. The Treasury Taskforce. <http://www.ibl.uni-stuttgart.de/05forschung/ppp/pdf/HM_Treasury/value_for_money_drivers_in_the_privatefinance_initiative_pdf_01-2000.pdf>.

Australasian Council of Auditors-General (1997). *Commercial Confidentiality and the Public Interest*. <<http://www.acag.org.au/ccpi.htm>>, as of April 8, 2009.

Bain, Robert, and Jan W. Plantagie (2007). *The Anatomy of Construction Risk: Lessons from a Millennium of PPP Experience*. Infrastructure Finance (April 5). Standard & Poor's. <[http://www.globalclearinghouse.org/InfraDev/assets%5C10/documents/S&P%20-%20The%20Anatomy%20of%20Construction%20Risk_Lessons%20form%20a%20Millennium%20of%20PPP%20Experience%20\(2007\).pdf](http://www.globalclearinghouse.org/InfraDev/assets%5C10/documents/S&P%20-%20The%20Anatomy%20of%20Construction%20Risk_Lessons%20form%20a%20Millennium%20of%20PPP%20Experience%20(2007).pdf)>.

Boarnet, Marlon, and Joseph Dimento (2004). The Private Sector's Role in Highway Finance: Lessons from SR91. *Access 25 Fall*: 26–31. <<http://www.uctc.net/access/25/Access%2025%20-%202005%20-%20Lessons%20From%20SR%2091.pdf>>.

Boardman, Anthony, Finn Poschmann, and Aidan Vining (2005). North American Infrastructure P3s: Examples and Lessons Learned. In G. Hodge and C. Greve (eds), *The Challenge of Public-Private Partnerships* (Edward Elgar): 163–189.

Brown, Trevor, and Mathew Potoski (2003). Managing Contract Performance: A Transaction Cost Approach. *Journal of Policy Analysis and Management* 22, 2: 275–297.

Brox, James A. (2008). Infrastructure Investment: The Foundation of Canadian Competitiveness. *IRPP Policy Matters* 9, 2: 1–47. <<http://www.irpp.org/pm/archive/pmvol9no2.pdf>>.

Burleton, Derek (2006). *Creating the Winning Conditions for Public-Private Partnerships (P3s) in Canada*. TD Economics Special Report (June 22). <http://www.td.com/economics/special/db0606_p3s.pdf>.

Cambridge Economic Policy Associates [CEPA] (2005). *Public Private Partnerships in Scotland: Evaluation of Performance*. Final Report (March). <<http://www.scotland.gov.uk/Resource/Doc/917/0011854.pdf>>.

Canada, Ministry of Finance (2013). *Jobs, Growth and Long-Term Prosperity: Economic Action Plan 2013*. <<http://www.budget.gc.ca/2013/doc/plan/toc-tdm-eng.html>>.

Canadian Council for Public-Private Partnerships [CCPPP] (2002). *Successful Transportation Public-Private Partnerships in Canada and the USA* (November). The Canadian Council for Public-Private Partnerships.

Canadian Council for Public-Private Partnerships [CCPPP] (2008). *Public Sector Accounting for Public-Private Partnership Transactions in Canada: A Position Paper by the Accounting Task Force of The Canadian Council for Public-Private Partnerships*. <http://www.pppcouncil.ca/pdf/pppfinance_072008.pdf>.

Canadian Council for Public-Private Partnerships [CCPPP] (2013a). *Definitions*. <<http://www.pppcouncil.ca/resources/about-ppp/definitions.html>>, as of February 15, 2013.

Canadian Council for Public-Private Partnerships [CCPPP] (2013b). *Canadian PPP Project Database*. <<http://projects.pppcouncil.ca/ccppp/src/public/search-project?pageid=3d067bedfe2f4677470dd6ccf64d05ed>>, as of January 30, 2013.

Canadian Union of Public Employees [CUPE] (2011). *Fact sheet: Municipal Infrastructure*. <<http://cupe.ca/s4d920c565467d/sheet-municipal-infrastructure>>.

Clemens, Jason, Charles Lammam, Milagros Palacios, and Niels Veldhuis (2007). *Government Failure in Canada: A Review of the Auditor General's Reports, 1992–2006*. Fraser Institute. <http://www.fraserinstitute.org/commerce.web/product_files/GovernmentFailureinCanada2007.pdf>.

Conference Board of Canada (2008). *Steering a Tricky Course: Effective Public-Private Partnerships for the Provision of Transportation Infrastructure and Services* (September). Conference Board of Canada.

Corner, David (2006). The United Kingdom Private Finance Initiative: The Challenge of Allocating Risk. *OECD Journal on Budgeting* 5: 3.

de Bettignies, Jean-Etienne, and Thomas Ross (2004). The Economics of Public Private Partnerships. *Canadian Public Policy* 30, 2: 135–154.

Debande, Olivier (2002). Private Financing of Transport Infrastructure: An Assessment of the UK Experience. *Journal of Transport Economics and Policy* 36, 3: 355–387.

Domberger, Simon, and Stephen Rimmer (1994). Competitive Tendering and Contracting in the Public Sector: A Survey. *International Journal of the Economics of Business* 1, 3: 439–453.

Domberger, Simon, Christine Hall, and Eric Ah Lik Li (1995). The Determinants of Price and Quality in Competitively Tendered Contracts. *Economic Journal* 105, 433: 1454–70.

Duffield, Colin, and Peter Raisbeck (2007). *Performance of PPPs and Traditional Procurement in Australia*. Infrastructure Partnerships Australia. <<http://www.infrastructure.org.au/Content/PPP.aspx>>.

European Commission [EC] (2003). *Guidelines for Successful Public-Private Partnerships* (March). <http://ec.europa.eu/regional_policy/sources/docgener/guides/ppp_en.pdf>.

Eggers, William D., and Tom Startup (2006). *Closing the Infrastructure Gap: The Role of Public-Private Partnerships*. Deloitte Research Study. <[http://www.deloitte.com/dtt/cda/doc/content/us_ps_ClosingInfrastructureGap2006\(1\).pdf](http://www.deloitte.com/dtt/cda/doc/content/us_ps_ClosingInfrastructureGap2006(1).pdf)>.

Federation of Canadian Municipalities [FCM] (2012). *The Road to Jobs and Growth: Submission to Government of Canada Long-Term Infrastructure Plan Consultation*. Federation of Canadian Municipalities. <http://www.fcm.ca/Documents/backgrounders/The_Road_to_Jobs_and_Growth_Solving_Canadas_Municipal_Infrastructure_Challenge_-_Submission_EN.pdf>.

Fernandez, Sergio, and Craig R. Smith (2006). Looking for Evidence of Public Employee Opposition to Privatization: An Empirical Study With Implications for Practice. *Review of Public Personnel Administration* 26, 4: 356–381.

Fitzgerald, Peter (2004). *Review of Partnerships Victoria Provided Infrastructure: Final Report to the Treasurer* (January). <<http://www.un.org/esa/coordination/Alliance/PPPInfrastructure.pdf>>.

Fussell, Heather, and Charley Beresford (2009). *Public Private Partnerships: Understanding the Challenge*. Columbia Institute. <http://www.civicgovernance.ca/files/uploads/columbiap3_eng_v8-webpdf.pdf>.

Gosling, Tim (2004). *Openness Survey Paper*. Institute for Public Policy Research (IPPR). <<http://www.ippr.org/uploadedFiles/projects/Openness%20survey%20final.PDF>>.

Government of Saskatchewan (2012). *Saskatchewan Plan for Growth: Vision 2020 and Beyond*. <<http://www.gov.sk.ca/adx/asp/adxGetMedia.aspx?DocID=3975,594,1,Documents&MediaID=4745&Filename=Saskatchewan+Plan+for+Growth+-+Full+Version.pdf>>.

Grimsey, Darrin, and Mervyn Lewis (2002). Evaluating the Risks of Public Private Partnerships for Infrastructure Projects. *International Journal of Project Management* 20, 2: 107–118.

Grimsey, Darrin, and Mervyn Lewis (2004). *Public Private Partnerships: The Worldwide Revolution in Infrastructure Provision and Project Finance*. Edward Elgar.

Gross, Morton, and Robert Shouldice (2008). Wide Open. *Project Finance Magazine*. <<http://www.projectfinancemagazine.com/default.asp?Page=20&PUB=157&ISS=24984&SID=711190>>, as of June 8, 2009.

Gross, Morty, Robert Shouldice, and Heather Douglas (2010). Spreading Out from Canadian PPP. *Project Finance Magazine*. <<http://www.projectfinancemagazine.com/Article/2676736/Spreading-out-from-Canadian-PPP.html>>, as of February 28, 2013

Hall, Peter (1982). *Great Planning Disasters*. University of California Press, Berkeley.

Harischandra, Kumi, Milagros Palacios, and Jason Clemens (2007). *The Benefits of Foreign Business Activity in Canada*. Fraser Institute. <http://www.fraserinstitute.org/commerce.web/product_files/benefitsforeignbus.pdf>.

Hartgen, David, Claire Chadwick, and M. Gregory Fields (2008). *Transportation Performance of the Canadian Provinces*. Fraser Institute. <http://www.fraserinstitute.org/Commerce.Web/product_files/TransportationPerformancePart1.pdf>.

HM Treasury (2003). *PFI: Meeting the Investment Challenge*. <http://www.hm-treasury.gov.uk/d/PFI_604a.pdf>.

HM Treasury (2012). *A New Approach to Public Private Partnerships*. <http://cdn.hm-treasury.gov.uk/infrastructure_new_approach_to_public_private_partnerships_051212.pdf>.

Iacobacci, Mario (2010). *Dispelling the Myths: A Pan-Canadian Assessment of Public-Private Partnerships for Infrastructure Investments*. Conference Board of Canada. <<http://www.conferenceboard.ca/e-library/abstract.aspx?did=3431>>.

Infrastructure Australia (2008). *National Public Private Partnership Policy and Guidelines*. <http://www.infrastructureaustralia.gov.au/public_private_partnership_policy_guidelines.aspx>, as of April 8, 2009.

International Monetary Fund [IMF] (2004). *Public-Private Partnerships*. <<http://www.imf.org/external/np/fad/2004/pifp/eng/031204.pdf>>, as of April 8, 2009.

Istrate, Emilia, and Robert Puentes (2011). *Moving Forward on Public Private Partnerships: U.S. and International Experience with PPP Units*. Brookings-Rockefeller Project on State and Metropolitan Innovation. <<http://www.brookings.edu/research/papers/2011/12/~//media/BC5358BD93B34E76ACD885F9BD60B35C.ashx>>.

Johnson, Robin A. (2001). *Privatization and Layoffs: The Real Story*. <<http://reason.org/news/show/127620.html>>.

Levin, Jonathan, and Steven Tadelis (2007). *Contracting for Government Services: Theory and Evidence from US Cities*. NBER Working Paper No. 13350. National Bureau of Economic Research.

Levy, Sidney M. (1996). *Build Operate Transfer*. Frank Mercede & Sons.

Malone, Nonie (2005). The Evolution of Private Financing of Government Infrastructure in Australia—2005 and Beyond. *Australian Economic Review* 38, 4: 420–430.

McDavid, James (1988). Privatizing Local Government Services in Canada. In M.A. Walker (ed.), *Privatization: Tactics and Techniques* (Fraser Institute): 101–116.

Mirza, Saeed (2007). *Danger Ahead: The Coming Collapse of Canada's Municipal Infrastructure*. A Report for the Federation of Canadian Municipalities (November). <http://www.fcm.ca/Documents/reports/Danger_Ahead_The_coming_collapse_of_Canadas_municipal_infrastructure_EN.pdf>.

Mott MacDonald (2002). *Review of Large Public Procurement in the UK*. HM Treasury. <[www.hm-treasury.gov.uk/d/7\(3\).pdf](http://www.hm-treasury.gov.uk/d/7(3).pdf)>.

Muren, Astri (2000). Quality Assurance in Competitively Tendered Contracts. *Journal of Transport Economics and Policy* 34, 1: 99–112.

Murphy, Timothy J. (2008). The Case for Public-Private Partnerships in Infrastructure. *Canadian Public Administration* 51, 1: 99–126.

National Audit Office [NAO] (2003). *PFI: Construction Performance*. Report by the Comptroller and Auditor General; HC 371 Session 2002-2003: 5 February 2003. <<http://www.nao.org.uk/wp-content/uploads/2003/02/0203371.pdf>> as of April 18, 2013.

National Audit Office [NAO] (2004). London Underground P3: Were they Good Deals? Report by the Comptroller and Auditor General. <<http://www.nao.org.uk/report/london-underground-ppp-were-they-good-deals/>>, as of April 8, 2009.

Nicosia, Nancy (2002). *Essays on Competitive Contracting: An Application to the Mass Transit Industry*. University of California.

Office of the Auditor General of British Columbia (2000). *A Review of The Fast Ferries Project: Governance and Risk Management*. Report 5 (October) <<http://www.bcauditor.com/pubs/1999/report5/review-fast-ferry-project-governance-and-risk-management>>.

Office of the Auditor General of British Columbia (2011). *Audit of the Academic Ambulatory Care Centre Public Private Partnership: Vancouver Coastal Health Authority*. Report 2 (May) <<http://www.bcauditor.com/pubs/2011/report2/public-private-partnership-P3-audit-VCHA-AACC>>.

Office of the Auditor General of British Columbia (2012). *Audits of Two P3 Projects in the Sea-To-Sky Corridor*. Report 4 (July). <<http://www.bcauditor.com/pubs/2012/report4/audits-two-p3-projects-sea-sky-corridor>>, as of February 27, 2013.

Office of the Auditor General of Nova Scotia (2010). *Report of the Auditor General: February 2010*. <<http://www.oag-ns.ca/feb2010/full0210.pdf>>, as of February 21, 2013.

Office of the Auditor General of Ontario (2008). Brampton Civic Hospital Public-private Partnership Project. Section 3.03 (pp. 102–124), *2008 Annual Report of the Office of the Auditor General of Ontario*. <http://www.auditor.on.ca/en/reports_en/en08/303en08.pdf>, as of April 18, 2013.

Office of the Auditor General of Ontario (2010). Brampton Civic Hospital Public-private Partnership Project. Section 4.03 (pp. 306–311), *2010 Annual Report of the Office of the Auditor General of Ontario*. <http://www.auditor.on.ca/en/reports_en/en10/403en10.pdf>, as of April 18, 2013.

Organisation for Economic Co-operation and Development [OECD] (2008). *Public-Private Partnerships: In Pursuit of Risk Sharing and Value for Money* (June). OECD.

Organisation for Economic Co-operation and Development [OECD] (2010). *Dedicated Public-Private Partnership Units: A Survey of Institutional and Governance Structures*. <<http://www.oecd.org/gov/budgeting/dedicatedpublic-privatepartnershipunitsasurveyofinstitutionalandgovernancestructures.htm>>.

Organisation for Economic Co-operation and Development [OECD] (2011). *Pension Funds Investment in Infrastructure: A Survey*. <<http://www.oecd.org/sti/futures/infrastructureto2030/48634596.pdf>>.

Organisation for Economic Co-operation and Development [OECD] (2012). *Recommendation of the Council on Principles for Public Governance of Public-Private Partnerships*. <<http://www.oecd.org/gov/budgeting/PPPnoSG.pdf>>.

Partnerships BC (2005). *Project Report: Achieving Value for Money: Sea-to-Sky Highway Improvement Project*. <<http://www.partnershipsbc.ca/pdf/SeatoSkyFinal.pdf>>.

Partnerships BC (2006). *Overview of Partnerships BC*. <http://www.partnershipsbc.ca/pdf/ql_corporate_overview.pdf>.

Partnerships BC (2007). *Procurement Related Disclosure for Public Private Partnerships*. Updated March 2007. <http://www.partnershipsbc.ca/pdf/pbc-disclosure_guidance-25-apr-07.pdf>.

Partnerships BC (2008). *Public Private Partnerships*. Presentation [by Larry Blain] to the PNWER – Transportation Working Group (July 23, 2008). <http://www.pnwerarchive.org/Portals/0/Presentations/2008%20summit/Larry%20Blain-%20Partnerships%20BC%20TRANSPORTATION_%20PUBLIC%20PRIVATE.pdf>, as of June 8, 2009.

Pollitt, Michael (2005). Learning from UK Private Finance Initiative Experience. In G. Hodge and C. Greve (eds.), *The Challenge of Public-Private Partnerships: Learning from International Experience* (Edward Elgar): 207–230.

Poschmann, Finn (2003). *Private Means to Public Ends: The Future of Public-Private Partnerships*. CD Howe Institute. <http://www.cdhowe.org/pdf/commentary_183.pdf>.

PPP Canada (2011). *Public-Private Partnerships: A Guide for Municipalities*. <http://www.p3canada.ca/_files/file/P3%20Guide%20for%20Municipalities%20-%20English%20-%20Final.pdf>.

PPP Canada (2013). *What is a P3?* <<http://www.p3canada.ca/what-is-a-p3.php>>, as of March 14, 2013.

Public Works Financing [PWF] (2008). *Public Works Financing October 2008 Newsletter—Volume 231*. Public Works Financing.

Public Works Financing [PWF] (2013). *International Major Projects Database*. Public Works Financing. Access purchased by author for one year on January 17, 2013. Data consulted on January 30, 2013. For more information on PWF, see <<http://pwfinance.net/>>.

Rangel, Thais, Jose Manuel Vassallo, and Blanca Arenas (2012). Effectiveness of Safety-based Incentives in Public Private Partnerships: Evidence from the Case of Spain. *Transportation Research Part A*, 46: 1166–1176.

Ross, Thomas. (2008). Three Bad Reasons to Do a Public-Private Partnership—And One Very Good One. *Business in Vancouver* (November 18).

Sagalyn, Lynne (2007). Longer View: Public/Private Development: Lessons from History, Research and Practice. *Journal of the American Planning Association* 73, 1: 7–22.

Savas, E.S., and E.J. McMahon (2002). *Competitive Contracting of Bus Service: A Better Deal for Riders and Taxpayers*. Civic Report 30. Manhattan Institute. <http://www.manhattan-institute.org/pdf/cr_30.pdf>.

Scribner, Marc. (2011) *The Limitations of Public-Private Partnerships: Recent Lessons from the Surface Transportation and Real Estate Sectors*. Issue Analysis 2001, No. 1. Competitive Enterprise Institute. <<http://cei.org/sites/default/files/Marc%20Scribner%20-%20The%20Limitations%20of%20Public-Private%20Partnerships.pdf>>.

Siemiatycki, Matti (2007). What's the Secret? The Application of Confidentiality in the Planning of Infrastructure Using Private-Public Partnerships. *Journal of the American Planning Association* 73, 4: 388–403.

Siemiatycki, Matti, and Naeem Farooqi (2012). Value for Money and Risk in Public-Private Partnerships. *Journal of American Planning Association* 78, 3: 286–299.

Sinoski, Kelly (2009, May 25). \$800-million Golden Ears Bridge to Open June 15, Weeks Ahead of Schedule. *Vancouver Sun*: A3 (Final Edition).

Sorensen, Jean (2009, February 12). Sea to Sky Highway in British Columbia Extends the Use of Half Bridges. *Engineering Technology. Journal of Commerce*. <<http://www.journalofcommerce.com/article/id32504>>.

St-Jean, Capt (N) E.M. (2008). *A Rising Tide that Lifts Leaky Boats: Public-Private Partnerships for Naval Infrastructure Renewal*. Research Paper NSSP 10 (May 13). Canadian Forces College. <<http://www.cfc.forces.gc.ca/papers/nssc/nssc10/stjean.pdf>>.

TD Economics (2004). *Mind the Gap: Finding the Money to Upgrade Canada's Aging Public Infrastructure*. TD Economics Special Report (May 20). <<http://www.td.com/economics/special/infra04.pdf>>.

United Kingdom, Department of the Treasury (2004). *Value for Money Assessment Guidance*. Her Majesty's Stationary Office, London.

United States, Department of Transportation [USDOT] (2009). *Public Private Partnerships*. <<http://www.fhwa.dot.gov/ppp/>>, as of April 8, 2009.

Vander Ploeg, Casey (2003). *A Capital Question: Infrastructure in Western Canada's Big Six*. Canada West Foundation. <<http://cwf.ca/pdf-docs/publications/A-Capital-Question-October-2003.pdf>>.

Vining, Aidan, and Anthony Boardman (2008a). Public-Private Partnerships: Eight Rules for Governments. *Public Works Management Policy* 13, 149: 149–160

Vining, Aidan, and Anthony Boardman (2008b). Public-Private Partnerships in Canada: Theory and Evidence. *Canadian Public Administration* 51, 1: 9–44.

About the authors

Joseph Berechman

Dr. Joseph Berechman is a Professor and Chairman of the Department of Economics, at City College, the City University of New York. Previously, he was the CN Chair Professor in Transportation and International Logistics, the Sauder School of Business, the University of British Columbia, Canada. Dr. Berechman has received his Bachelor degree from the Hebrew University in Jerusalem, Israel, his M.B.A. from the Wharton School, and Ph.D. degree from the University of Pennsylvania, Philadelphia. Subsequently, he was on the faculty of SUNY Buffalo, Tel-Aviv University, and the University of California, Irvine. He also was a Fellow at The Netherlands Institute for Advanced Studies. Dr. Berechman has consulted on a variety of transportation and urban projects in different countries and has been a principal investigator in several major studies done for the European Union. For the past several years, he has been engaged in major cost and investment studies of transportation infrastructure projects in New York. He has published numerous journal papers and four research books. Dr. Berechman's current research focuses on transportation infrastructure investment evaluation and pricing; the relationships between transportation development and economic growth, and the estimation of full marginal costs from additional truck traffic.

Charles Lamnam

Charles Lamnam is Associate Director of the Centre for Tax & Budget Policy and the Centre for Studies in Economic Prosperity at the Fraser Institute. Since joining the Institute, Mr. Lamnam has published over 20 research reports and 100 commentaries on a wide range of public-policy issues such as taxation, government finances and performance, investment, entrepreneurship, income mobility, labour markets, transportation infrastructure, and charitable giving. His commentaries have appeared in every major Canadian newspaper including the *National Post*, *Globe and Mail*, *Ottawa Citizen*, *Toronto Sun*, *Montreal Gazette*, *Calgary Herald*, and *Vancouver Sun*. He is a frequent contributor to *Fraser Forum*, the Fraser Institute's flagship policy magazine. Mr. Lamnam also regularly gives presentations to various groups, responds to media queries, and appears on radio and television broadcasts across the country to discuss the Institute's research. He has appeared before committees of the House of Commons as an expert witness. Mr. Lamnam holds an M.A. in public policy and a B.A. in economics with a minor in business administration from Simon Fraser University.

Hugh MacIntyre

Hugh MacIntyre is a Policy Analyst in the Fraser Institute's Centre for Tax and Budget Policy. He has an M.Sc. in Multilevel and Regional Politics from the University of Edinburgh.

Acknowledgments

The authors would like to thank a number of individuals for their contributions and assistance in completing this study. They first thank William Reinhardt, editor and publisher at Public Works Financing, for providing the P3 data used in the study. The authors also thank the following individuals for formally peer-reviewing the study and giving helpful comments and suggestion: Robert Poole, director of transportation policy and Searle Freedom Trust Transportation Fellow at Reason Foundation; John Hunter, an experienced P3 practitioner and president and CEO of J. Hunter and Associates; and Nadeem Esmail, director of Health Policy studies at the Fraser Institute. They thank Niels Veldhuis, Fraser Institute president, for his feedback on earlier drafts of the study. Any remaining errors and omissions are the sole responsibility of the authors.

Finally, the authors greatly appreciate the assistance and diligence of the Fraser Institute's publications team whose work improved the overall quality of the study. The views expressed in this study do not necessarily represent the views of the trustees, supporters, or other staff of the Fraser Institute.

Publishing information

Distribution

These publications are available from <<http://www.fraserinstitute.org>> in Portable Document Format (PDF) and can be read with Adobe Acrobat® or Adobe Reader®, versions 7 or later. Adobe Reader® XI, the most recent version, is available free of charge from Adobe Systems Inc. at <<http://get.adobe.com/reader/>>. Readers having trouble viewing or printing our PDF files using applications from other manufacturers (e.g., Apple's Preview) should use Reader® or Acrobat®.

Ordering publications

To order printed publications from the Fraser Institute, please contact the publications coordinator:

- e-mail: sales@fraserinstitute.org
- telephone: 604.688.0221 ext. 580 or, toll free, 1.800.665.3558 ext. 580
- fax: 604.688.8539.

Media

For media enquiries, please contact our Communications Department:

- 604.714.4582
- e-mail: communications@fraserinstitute.org.

Copyright

Copyright © 2013 by the Fraser Institute. All rights reserved. No part of this publication may be reproduced in any manner whatsoever without written permission except in the case of brief passages quoted in critical articles and reviews.

Date of issue

April 2013

Citation

Charles Lammam, Hugh MacIntyre, and Joseph Berechman (2013). *Using Public-Private Partnerships to Improve Transportation Infrastructure in Canada*. Studies in Economic Prosperity. Fraser Institute. <<http://www.fraserinstitute.org>>.

Cover design

Bill Ray

Cover images

©KWDesigns, Flickr® (off-ramp)

Supporting the Fraser Institute

To learn how to support the Fraser Institute, please contact

- Development Department, Fraser Institute
Fourth Floor, 1770 Burrard Street
Vancouver, British Columbia, V6J 3G7 Canada
- telephone, toll-free: 1.800.665.3558 ext. 586
- e-mail: development@fraserinstitute.org

Lifetime patrons

For their long-standing and valuable support contributing to the success of the Fraser Institute, the following people have been recognized and inducted as Lifetime Patrons of the Fraser Institute.

Sonja Bata	Serge Darkazanli	Fred Mannix
Charles Barlow	John Dobson	Jack Pirie
Ev Berg	Raymond Heung	Con Riley
Art Grunder	Bill Korol	Catherine Windels
Jim Chaplin	Bill Mackness	

Purpose, funding, & independence

The Fraser Institute provides a useful public service. We report objective information about the economic and social effects of current public policies, and we offer evidence-based research and education about policy options that can improve the quality of life.

The Institute is a non-profit organization. Our activities are funded by charitable donations, unrestricted grants, ticket sales, and sponsorships from events, the licensing of products for public distribution, and the sale of publications.

All research is subject to rigorous review by external experts, and is conducted and published separately from the Institute's Board of Trustees and its donors.

The opinions expressed by the authors are those of the individuals themselves, and do not necessarily reflect those of the Institute, its Board of Trustees, its donors and supporters, or its staff. This publication in no way implies that the Fraser Institute, its trustees, or staff are in favour of, or oppose the passage of, any bill; or that they support or oppose any particular political party or candidate.

As a healthy part of public discussion among fellow citizens who desire to improve the lives of people through better public policy, the Institute welcomes evidence-focused scrutiny of the research we publish, including verification of data sources, replication of analytical methods, and intelligent debate about the practical effects of policy recommendations.

About the Fraser Institute

Our vision is a free and prosperous world where individuals benefit from greater choice, competitive markets, and personal responsibility. Our mission is to measure, study, and communicate the impact of competitive markets and government interventions on the welfare of individuals.

Founded in 1974, we are an independent Canadian research and educational organization with locations throughout North America and international partners in over 85 countries. Our work is financed by tax-deductible contributions from thousands of individuals, organizations, and foundations. In order to protect its independence, the Institute does not accept grants from government or contracts for research.

Nous envisageons un monde libre et prospère, où chaque personne bénéficie d'un plus grand choix, de marchés concurrentiels et de responsabilités individuelles. Notre mission consiste à mesurer, à étudier et à communiquer l'effet des marchés concurrentiels et des interventions gouvernementales sur le bien-être des individus.

Peer review—validating the accuracy of our research

The Fraser Institute maintains a rigorous peer review process for its research. New research, major research projects, and substantively modified research conducted by the Fraser Institute are reviewed by experts with a recognized expertise in the topic area being addressed. Whenever possible, external review is a blind process. Updates to previously reviewed research or new editions of previously reviewed research are not reviewed unless the update includes substantive or material changes in the methodology.

The review process is overseen by the directors of the Institute's research departments who are responsible for ensuring all research published by the Institute passes through the appropriate peer review. If a dispute about the recommendations of the reviewers should arise during the Institute's peer review process, the Institute has an Editorial Advisory Board, a panel of scholars from Canada, the United States, and Europe to whom it can turn for help in resolving the dispute.

Editorial Advisory Board

Members

Prof. Terry L. Anderson	Prof. Herbert G. Grubel
Prof. Robert Barro	Prof. James Gwartney
Prof. Michael Bliss	Prof. Ronald W. Jones
Prof. Jean-Pierre Centi	Dr. Jerry Jordan
Prof. John Chant	Prof. Ross McKittrick
Prof. Bev Dahlby	Prof. Michael Parkin
Prof. Erwin Diewert	Prof. Friedrich Schneider
Prof. Stephen Easton	Prof. Lawrence B. Smith
Prof. J.C. Herbert Emery	Dr. Vito Tanzi
Prof. Jack L. Granatstein	

Past members

Prof. Armen Alchian*	Prof. F.G. Pennance*
Prof. James M. Buchanan*†	Prof. George Stigler*†
Prof. Friedrich A. Hayek*†	Sir Alan Walters*
Prof. H.G. Johnson*	Prof. Edwin G. West*

* deceased; † Nobel Laureate