

**PUBLIC-PRIVATE PARTNERSHIPS IN THE U.S. AND
CANADA: CASE STUDIES AND LESSONS¹**

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ABSTRACT. Governments in many industrialized nations have made concerted efforts to reduce their direct expenditures. Public-private partnerships (P3s) are one emerging method of doing so. Despite their increased use, little independent research has been conducted on the effectiveness of P3s. This article reviews recent P3 experience in the U.S. and Canada. It briefly reviews the rationale for P3s and identifies a number of major P3s in the U.S. and Canada. Evidence from six project case studies and an analysis of U.S. prison P3s suggests that the private sector often attempts to gain as much as it can at the expense of the public sector. Contractual costs have been high, especially in the presence of complexity/uncertainty, asset specificity, and lack of contract management skills. There has sometimes been a political imperative to prevent projects from terminating. In such circumstances, there have been instances where private or public partners have behaved opportunistically. Unless public sector managers recognize that they must design contracts that both compensate private sector partners for risk and *then ensure that they actually bear it*, P3s will not improve allocative efficiency (make society better off). This article's purpose is to draw attention to the importance of appropriate institutional design.

INTRODUCTION

Governments in many industrialized nations, and at all levels, have made a concerted effort to reduce their direct expenditures (Grout & Stevens, 2003:220). Public-private partnerships (P3s) are one method of

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reducing these expenditures (at least in the short-run) that is attracting growing interest. Consequently, they are becoming an important form of procurement for all levels of government in many countries. How effective are P3s as a public policy instrument? This article reviews the emerging experience regarding P3s in the U.S. and Canada, focussing on examples of major infrastructure projects. While projects with partnership characteristics began to emerge in the 1980s, it was not until the mid-1990s that P3s really began to take hold. Since then, P3 projects have taken root in many jurisdictions.

A wide range of relationships between the public sector and for-profit private firms could potentially be labelled as P3s.² Perhaps the critical distinguishing feature of a P3 compared to contracting-out or standard government procurement is that it involves an ongoing contractual relationship between a public sector entity and a private sector entity with some degree of joint decision-making and financial risk-sharing. Infrastructure P3s, therefore, require an explicit contract—between a government entity and one or more private sector firms—where the private sector entity agrees to finance, build and operate some facility for a specific period of time after which ownership is transferred to the public sector.³ These projects are frequently referred to as Build-Operate-Transfer projects or BOTs. The governmental entity is sometimes the (intermediate) customer for the project's output and is sometimes responsible for the payment of the user fees. In other cases, toll roads, for example, the public partner negotiates the contract and sometimes specifies unit prices, but road users pay the private contractor directly.

After briefly reviewing the rationales for P3s, and providing an overview of major P3s in the United States and Canada, this article will present six case studies of individual projects—three in the U.S. and three in Canada, and provide an additional form of case study evidence—a type of meta-analysis of prison P3s in the U.S. Finally, some of the lessons will be drawn from all the case study evidence.

The overall lessons from the case studies suggest that the prognosis for future P3s is somewhat pessimistic. Governments have generally found it difficult to *effectively* reduce their financial and budgetary exposure. Furthermore, in some cases, governments have faced significant increased political risk rather than reduced risk as they had hoped. At the same time, their for-profit private sector partners have had

difficulty making adequate rates of return, although this is a tentative conclusion as they have usually had incentives to publicly emphasize losses. Although based on a limited number of case studies in the U.S. and Canada, the fragmentary evidence from other P3s appears to be similar (e.g., Bartelme, 2004). These findings are also quite similar to those on P3s in the United Kingdom (Broadbent & Laughlin, 2004; Grout & Stevens, 2003:230). This evidence, in total, suggests that our findings are generalizable.

In some respects, the somewhat negative findings are not surprising. The public and private partners in P3s inevitably have conflicting interests (Teisman & Klijn, 2002; Trailer et al., 2004). Studies have shown that in other contexts with similar conflicting interests, such as mixed enterprises that are jointly owned by private shareholders and government, the result can be “the worst of both worlds”, achieving neither high profitability nor worthwhile social goals (Eckel & Vining, 1985; Boardman & Vining, 1989). In sum, while the allocation of decision-making and risk-sharing in P3s can vary widely, if decision-making authority and financial risk-bearing are not appropriately and clearly matched, incentives will be misaligned and effective outcomes are unlikely. This raises the question of whether governments can learn, individually or collectively, to adequately specify contract conditions and institutional conflict resolution mechanisms *ex ante* so that the past is not a prologue for the future.

THE RATIONALES FOR P3S

Why do governments utilize P3s rather than more direct means of public provision? While we can find few cases where governments have explicitly laid out their motivations, governments generally appear to want to reduce both their financial risk, especially their downside exposure, and the accompanying political risk that goes with large cost overruns and increasing expenditures.

Five specific reasons related to this general rationale appear to motivate them. First, governments usually argue that the main reason is to provide the service at a lower cost, resulting primarily from superior private-sector scale efficiencies and technical efficiency, also called X-efficiency. A second reason is financial risk reduction. This pertains to both the cost of the project and the future revenue stream. Large government infrastructure projects in a wide variety of jurisdictions have

often cost far more than anticipated or budgeted (Boardman, Mallery & Vining, 1994; Flyvberg, Holm & Buhl, 2002; GAO, 2003; NAO, 2003). Furthermore, future revenue streams from these projects are often highly uncertain. A third reason is governments' desire to avoid up-front capital costs—it is easier to raise private capital than additional tax revenues or government loans. In the U.S., bond issues are often subject to voter referendum. But, voters may simultaneously demand more services and vote against bond proposals (Pozen, 2003). A fourth reason is to keep public sector budgets, and especially budget deficits, down. Most U.S. states have constitutional or legislative requirements to balance budgets, and while Canadian provincial governments can run deficits, there are political benefits to keeping large capital projects off the balance sheet or “off-budget.” Fifth, governments may believe (or at least want to believe) that private-sector provision of financing means that it is easier to impose user fees at lower political cost. The reasoning is that while voters sometimes accept that the private sector needs to raise revenue to make a profit and repay its debt, they are less willing to accept the argument that the public sector needs to do so.

Are these rationales well-founded? There are certainly a number of theoretical reasons to expect that delivery via P3s could lower costs. There are three dimensions to this cost superiority argument. First, private sector firms may be able to utilize superior scale, scope or learning economies. Private sector firms often enjoy project-specific economies of scale and scope advantages compared to most governments, especially to sub-national governments. Larger firms may engage in many similar projects and be global in scope. In contrast, many governments at the sub-state level cannot achieve minimum efficient scale (Globerman & Vining, 1996). Large firms not only benefit from these scale effects directly, but they also allow them to utilize learning economies—specialized knowledge accumulated through learning and experience (Lapre & Van Wassenhove, 2003). These cost advantages are likely to be most important during the construction phase of projects, but they can also be important in reducing the cost of raising equity and debt capital (in other words, before construction).

Second, the private sector normally has superior incentives to minimize costs, holding constant any scale, scope or learning effects. Put another way, the private sector has lower agency costs, as is clearly illustrated in the recent privatization literature (Megginson & Netter, 2001). Nonetheless, as we discuss below, specific incentive structures

can negate or reverse these normal incentives. Because of the cost-reduction profit incentives, they may have more cost-efficient operations, including procurement policies, and better project management skills. They may also have lower wage costs, possibly due to hiring non-union labor (Hundley, 1991; Gregory & Borland, 1999). These technical efficiency cost advantages are likely to be relatively most important during the operational and management phases of projects. Third, firms have superior incentives to engage in cost-reducing innovation (dynamic technical efficiency).

Although these rationales for using P3s clearly have some *prima facie* merit, there have been critics of P3s (Rosenau, 1999; Teisman & Klijn, 2002). First, and most importantly, the ability of a P3 to provide a project at lower cost to government or the rest of society depends on the private sector partner having the appropriate incentives to minimize costs *and* to pass some of these cost savings on to the public sector partner. Firms are interested in profit maximization, rather than cost minimization. If they are paid on a cost-plus basis, whether deliberately or because of a lack of foresight, then they will have an incentive to raise costs (McAfee & McMillan, 1988). Even if they can achieve lower costs, they have no intrinsic desire to pass on lower costs as low prices. Sophisticated private sector equity investors are especially wary of engaging in contracts with prices that will not fully compensate them for all risks they assume. They have incentives to minimize the risk they do take by forming stand-alone project corporations that are isolated from their other corporate activities (thereby reducing the costs of bankruptcy if it becomes necessary), by limiting their equity participation and by utilizing a considerable degree of third-party debt financing (Roll & Verbeke, 1998). All of these behaviors are consistent with agency theory (Jensen & Meckling, 1976; Trailer et al., 2004).

Second, critics argue that the cost of financing may be lower for the public sector. U.S. tax policy generally favours the public sector because state and local governments may issue bonds that are exempt from state and federal taxes. Canadian tax policy does not provide such tax benefits, but provincial bonds generally carry a lower interest rate than corporate bonds. After a comprehensive review of the issues, de Bettignies and Ross (2004) conclude that it is not at all clear that governments are able to borrow at a lower cost than the private sector.⁴ Additionally, there is a trend for some governments to provide equivalent tax-exempt status to P3 projects, further leveling the playing field.

Third, concerning the third rationale for P3s—keeping the project off the public balance sheet—the government will normally account for the project in accordance with public sector accounting principles or practice. However, it is important to recognize that the accounting may not reflect the underlying economic reality. For example, a government or health care provider that constructs a new hospital using a P3 will have to pay for it at some point in time either via a rent charge or a user charge. The present value of this payment is likely to be at least equivalent to the cost of constructing the hospital or even higher. Thus, while there may be a political benefit in keeping the debt off the books, this is not a fundamental economic rationale for P3s.

The critical issue in evaluating the success of a P3 is whether the total cost of the P3 is lower than the total cost of the counter-factual of government provision. Total cost equals production cost plus transaction costs (Williamson, 1975). Transaction costs include the cost of negotiating, monitoring and, if necessary, re-negotiating contracts.⁵ Many transaction costs are not captured in traditional budgeting of projects, although they may be reflected in other government budgets, such as legal departments. Proponents of P3s have tended to focus on the ability of P3s to deliver projects more promptly and at lower construction costs than can government. There is some evidence to support this argument (NAO, 2003). While these two measures do represent some degree of “success”, and are dimensions where traditional public sector projects are weakest, they are narrow and can be to some degree self-serving. They are certainly not comprehensive measures of success as they do include transaction costs and do not consider what costs might have been under alternative provision. In sum, they are not equivalent to a social benefit-cost analysis. Independent studies of P3 performance that use comprehensive measures of performance are rare and admittedly difficult.

OVERVIEW OF U.S. AND CANADIAN P3S

There has been a long history of private sector provision of various kinds of public goods and services in North America. For example, the first private turnpike in the U.S. was chartered by Pennsylvania in 1792. Franchise contracts were introduced in New York City in the 1820s for gas and in the 1830s for street railway transportation. Over the years, cities extended such contracts to many municipal services including gas, electricity, water, sewer, street railways, telephone, subways, railroad

terminals, ferries, private bridges, tunnels and toll roads. While these franchises might not meet a contemporary definition of a P3, they did have some partnership-like elements. As Priest (1993:294) notes “the interaction between the regulator and the regulated firm or industry is difficult to distinguish from long-term contracting, dominated by predictable problems of unilateral or mutual adjustment over time in response to changing conditions.”

P3s have re-emerged in the U.S. and Canada in the mid-1990s. North American governments, like those in Europe and Australia, have been attracted to P3s in the areas of transportation, water and wastewater, and for other technologically complex projects. Norment (2002:27) notes that “The most dominant area, both in number of projects and total dollar volume of business, is in water and wastewater facilities”.

Table 1 summarizes the major P3s in the U.S. and Canada. Unfortunately, this is not a comprehensive list, but it attempts to include all of the largest and most well-known P3s. Some of these projects are very large, for example, the Toronto Pearson International Airport in Ontario which cost CA\$4.4 billion and the new International Air Terminal at John F. Kennedy Airport in New York which cost \$1.4 billion. It is notable that less than half of these projects include *significant* private-partner financing roles. Nonetheless, many do involve some private financing.

P3 PROJECT CASE STUDIES

We review the following six case studies of specific projects because of the availability of information, the size and profile of the projects and the lessons they offer for P3 contract theory, design and implementation. Three are in the U.S.: the Dulles Greenway in Virginia, Route 91 in Orange County and the Tampa Bay Seawater Desalination Plant in Florida, and three in Canada: the Alberta Special Waste Management System, Highway 407 in the Greater Toronto Area and the Confederation Bridge linking Prince Edward Island with the Canadian mainland.

Dulles Greenway

U.S. federal law essentially banned toll roads until 1991 (CBO, 1997). In that year the passage of the Intermodal Surface Transportation Efficiency Act explicitly authorized their use. In spite of this, the United

States General Accounting Office (GAO) recently concluded that: “Active private sector sponsorship and investment has been used to a limited extent in the United States to fund construct, and operate major highway and transit projects; as a consequence, the nation’s experience with active private sector sponsorship and investment has been limited” (GAO, 2004). The GAO identified only two major recent P3 highway projects that have been completed and that include for-profit private partners (GAO, 2004). These are the Dulles Greenway toll road in Virginia and Orange County State Route 91 Express Lanes in southern California.

The Dulles Greenway (formerly the Dulles Toll Road extension) is a fourteen and a half mile toll road that runs from Dulles International Airport to Leesburg in Virginia. Apart from \$3.5 million in state funds, its owner, the Toll Road Investors Partnership II (a partnership of local interests, the Italian toll road operator Autostrade S.P.A. and Kellogg, Brown and Root), raised \$360 million in private capital to finance the startup. However, the project only involved approximately \$40 million in equity financing (GAO, 2004). At the time, this financing did not qualify as a tax-exempt bond issue (Taliaferro, 1997).

Construction was originally scheduled to start in 1989 and to be completed by 1992. However, financing and environmental concerns postponed construction until September 1993. The highway opened in September 1995, six months ahead of schedule. However, early ridership was lower than projected, and the project went into default in July, 1996—within a year of its opening.

Demand forecasts were based on an independent consultant’s report conducted in the late 1980s, prior to the economic downturn in the early 1990s. This report assumed demand would be approximately 20,000 vehicles per day at a toll of \$1.50 for the first year, rising to 34,000 per day at the same toll rate by 1995 (Wooldridge et al., 2002). The delay in opening the road was ignored and ridership was forecast at 34,000 per day (Pae, 1995).

Tolls were lowered from an initial \$1.75 to \$1.00. While trips increased, this had a marginal impact on revenues due to the lower tolls. In 1998/99, debt was restructured and did qualify for tax-favorable treatment, thus lowering carrying costs.⁶ Usage has increased over a six year period from about 10,000 per weekday to about 60,000 (Brumback, 2003). Nevertheless, the partnership’s losses have been about \$30

million per year, and profitability will depend on future revenue growth covering capital and operating costs.

The Dulles Greenway case study illustrates a “vicious cycle” that seems to afflict quite a few P3 highway projects: tolls are set high in an attempt to cover financing and operating costs, demand is overestimated at the prospective toll (it is assumed that demand will be not much lower than it would be at zero price), the tolls discourage usage and thus total revenues are not high enough to cover financing and operating costs. Tolls are lowered, as a result demand increases, but total revenues do not increase substantially and still do not cover financing and operating costs; the builder/operator requests some form of bailout by government and if it does not get it, the firm slides into technical default.

The potential for this cycle is not as common in more incremental reforms to highway procurement contracting that introduce some greater degree of incentive-compatibility between government and highway construction firms. Various forms of performance-based contracting do seem to improve highway procurement (Batelle Corporation, 2003).

SR 91, Orange County

State Route (SR) 91 was authorized by the California legislature in 1991.⁷ A 10-mile stretch of the California freeway opened in 1995 with the median lanes of the highway dedicated as the SR 91 Express Lanes. These lanes were operated as a P3. Access to these lanes was restricted and operated as an electronic toll road. Toll rates were not regulated, but the operator could not earn a return in excess of 17%. The agreement included a non-compete clause which restricted improvements to the freeway or nearby roads in the corridor except for safety reasons (Poole, 2000).

The developer and operator of the project was the California Private Transportation Company (CPTC). CPTC was a limited partnership that included Peter Kiewit Sons (a large construction firm), Cofiroute (a French toll road company) and Granite Construction (a local Californian firm). The public sector partners were the California Department of Transportation (Caltrans) and the Orange County Transportation Authority. Upon completion in 1995, the state owned the lanes, but CPTC was to operate, maintain and police the road for 35 years. After the 35-year period the roadway management would revert to the

government. Initial private financing raised approximately \$125 million, although only 20 million was CPTC's equity (GAO, 2004).

Volume on SR 91 increased steadily from 7.3 million trips in 1999 to 9.5 million trips per annum in 2002, while over the same period revenue grew from \$19.5 million to \$29 million (GAO, 2004:43). In 1999, there was an attempt to sell CPTC to a newly created non-profit entity for \$260 million. There was a public outcry over the perception that this was a non-arms-length "sweetheart" deal and the sale was cancelled. Over this period, the Orange County government came under increasing political pressure because of the contract conditions. The manifest focus of conflict was the non-compete clause, but CPTC's profitability also seems to have been a latent issue. Caltrans essentially decided to ignore the non-compete clause and tried to expand capacity in 1999, claiming that safety was an issue. However, CPTC sued and Caltrans was forced to settle after the discovery process revealed Caltrans internal documents admitting there was no significant safety issue (Poole, 2000). There were other lawsuits filed by Riverside County as well as two unsuccessful legislative attempts to void the non-compete clause and acquire the tolls lanes via condemnation. In 2002, the Orange County Transportation Authority finally reached an agreement with CPTC to purchase SR 91 for \$207.5 million. The road continued to be managed by a successor corporation to CPTC named Cofiroute Mobility.

It could be argued that SR 91 was successful—the lanes were built quickly and at projected cost. Riders use the lanes every day. The ultimate sale back to government was certainly portrayed as a "win-win" situation by both sides. Looked at from a broader public policy perspective, however, it is hardly an exemplary example of partnership between the public and private sectors. Both parties exhibited opportunistic behavior. Over a number of years, the transaction costs, including legal costs and negotiation costs, were enormous.

Tampa Bay Seawater Desalination Project

The Tampa Bay region decided in the mid-1990s to solve a looming water shortage by constructing a major water desalination plant. The plant was projected to process 25 million gallons a day, or approximately 10% of the volume that West Coast Regional Water Supply (now Tampa Bay Water), the region's water supplier, provided to the cities of Tampa Bay, St. Petersburg and New Port Richey, as well as surrounding counties. At the time, this desalination process was still an emerging

technology and was expected to be considerably more expensive than incremental conventional groundwater sources (Johnson, 2003). However, the Southwest Florida Water Management District was putting pressure on jurisdictions to reduce groundwater pumping and was prepared to provide subsidies for desalination. No other utility in the United States provided water by desalination on a regular basis.

The water utility wished to proceed with a P3 that protected it from financial risk. The project was divided into two separate components: an engineering-procurement-construction project and a 30-year operations and maintenance contract. Initial bids offered to provide water at \$2 to \$3 per 1,000 gallons. These price quotes were considerably below the price the water utility expected to pay because firms appear to have hoped to gain an early lead in the desalination market. Covanta Tampa Construction was selected for both the construction contract and a 30-year operations-maintenance contract.

The relationship between the utility and the firm appears to have been fraught with mistrust, partly brought about by constant delays in completing the plant. Eventually, Covanta filed for bankruptcy in October, 2003 with the operations and management contract (worth approximately \$350 million) as its only asset. One reason for the bankruptcy filing was to prevent Tampa Bay Water from terminating Covanta's contract and replacing it with another firm.

The plant was completed in 2003. Although the plant has begun producing water, Tampa Bay Water refused to approve the plant during a 14-day acceptance test, claiming major deficiencies (Wright, 2003). The main problem appeared to be that the costly purification membranes clogged easily and needed replacement much more frequently than forecast. Without this approval, Covanta was blocked from beginning the operations and management contract. In 2003, a U.S. Court ordered the parties into mediation, but by 2004 the relationship had terminated with Tampa Water paying Covanta \$4.4 million of the \$7.9 million it had retained from the construction contract.

At the time of writing, the plant was producing 22.4 million gallons a day, not far off its projected volume of 25 million gallons, albeit at higher than projected costs. Tampa Bay Water is negotiating with a number of firms concerning repairs to the filters and other problems. These repairs are forecast to cost somewhere between \$8 million and \$20 million (Pittman, 2004). The *St. Petersburg Times* (2003: p. 14A)

concludes: “The dumbfounding part of the troubled odyssey in opening this important desalination plant is that the contract arrangement was designed to limit the public’s financial liability.”

The Alberta Special Waste Management System

The Alberta Special Waste Management System (ASWMS) was created in 1987. It was jointly owned by a provincial corporation (40 percent), and BOVAR Inc., a private firm (60 percent). ASWMS built an integrated hazardous waste-treatment facility at Swan Hills, Alberta. BOVAR was to collect 60 percent of the profits and all of the net earnings of the operator (Chem-Security). Under the agreement, BOVAR also received a guaranteed minimum return on capital linked to the current prime rate regardless of the profitability of the venture (Mintz, 1995). Furthermore, the provincial government provided debt guarantees for BOVAR, as well as indemnity against any future remediation or insurance liabilities in excess of \$1 million. This arrangement followed from the Alberta government’s belief that a private sector entity could build and operate the plant more efficiently than the public sector, although it recognized that the plant would not be commercially viable without subsidies.

The parties later modified the agreement to permit a large capacity expansion. Partly as result of this expansion, the subsidy turned out to be considerably larger than expected—approximately \$445 million in total between 1986 and 1995 (Mintz, 1995). Importantly, the additional capacity turned out to be excessive.⁸ The plant has operated at about 50 percent of its capacity through most of its life. In 1995, The Alberta government bought out BOVAR’s ownership interest for \$150 million. In 2000, in exchange for \$1, BOVAR returned the facility to the province of Alberta, as permitted under the agreement. Subsequently, a partnership agreement was negotiated with another private operator which assumed plant operation in April 2001.

The contract’s return-on-capital provisions provided a clear incentive for overcapitalization (Averch & Johnson, 1962). BOVAR’s profits did not depend on revenue exceeding costs: earnings were a function of capital investment, rather than efficiency or profitability.⁹ BOVAR also had no incentive to encourage cost reductions by the plant operator. As a result, BOVAR received a high, guaranteed rate of return, although it was exposed to little risk.¹⁰

Because there was no useful sharing of risk and reward, it is hard to classify Swan Hills as a successful P3. The result was a waste-treatment facility with capacity that exceeded Alberta's needs, having been built and operated under terms very costly to provincial taxpayers.

The Highway 407 Express Toll Route¹¹

Highway 407 is a controlled-access 108 kilometre highway that crosses the north side of metropolitan Toronto. The request for proposals (RFP) was announced in the fall of 1993, when the Province of Ontario was emerging from a recession which had left it in a weak financial position. The recession and the province's high debt provided the economic backdrop that made a toll road politically viable. The 407 project was launched through a special-purpose entity that the Ontario government created to manage the procurement process.

The original RFP indicated that the province would be responsible for land assembly and related costs. The selected private partner would provide financing, guarantee a maximum construction price and operate the highway. It would be paid from toll revenues, but neither traffic levels nor toll revenues were guaranteed. Given this, the private partner would be financially exposed to operational risk. The RFP specified few characteristics of the highway, facilitating private-sector innovation and providing the opportunity to profit from relevant technical skills and management ability.

In responding to the RFP, credible private partners were reluctant to assume financing risks on top of construction and operating risks. Indeed, both of the two qualified consortia sought extensive provincial backing for the project debt. Without a toll-revenue guarantee to help a private firm achieve an investment-grade rating for its debt, a private firm would have had to pay at least 75 basis points more for debt financing than would the province (Hambros, 1999). This argument was used as a rationale by the province for taking over financing of the project.¹² Subsequently, one consortium was allocated the contract for construction and highway maintenance, while the other would manage the toll system. However, this removal of financial risk fundamentally transformed the project. Once the bulk of the capital cost and financial risk shifted to the province, the project necessarily lost much of its P3 quality. The private partner was now tendering a fixed-price contract.

Although the private firm shared the design and quality assurance risks, the province assumed ownership and significant operational risk.

Financial risks to the province, however, were reduced when the province sold the highway's operating concession to a Canadian-Spanish-Australian consortium for \$3.1 billion after it had been operating for eighteen months (Mendoza et al., 1999). The term of the concession is for 99 years, after which ownership of the asset reverts to the government. The operating consortium was given the unilateral right to set tolls. The sale was essentially a privatization, although the highway eventually returns to the province. In 2004, the consortium attempted to raise tolls, claiming it was losing money (Mackie, 2004). In the meantime, the province had gone through a change of government and the new government was fighting the toll increase, although it had no contractual right to do so. At the time of writing, there is potential for a trade dispute with Spain over the province's attempt to reinterpret the contract (Mackie, 2004).

It is difficult to make an assessment of the success of this project. The 407 project has been successful to the extent that the highway was built quickly and without major cost overruns. The highway generates 300,000 daily vehicle trips, and it shifts nearly 200 million kilometres in travel per month from un-tolled public highways.¹³ Given that each vehicle kilometre is billed to users and that no part of the highway exercises an effective monopoly, these figures suggest there is significant demand for the road.

The 407 design process appears to have saved substantial provincial money in the initial construction phase, perhaps in the order of \$300 million (Hambros, 1999). Some of these savings were not realized, however, because design changes were needed before the highway opened. These changes were charged to the province because the parties agreed they were not part of the initial price-guaranteed contract. The full extent of savings is therefore unclear. And while innovative design features such as short entrances and narrow radius ramps certainly reduced land assembly and construction costs, any negative safety impacts will only be revealed over the highway's life.

Overall, though, the 407 does not stand out as an exemplary P3 model, owing to the failure of the government to effectively share financing risks.

The Confederation Bridge to Prince Edward Island

Prince Edward Island (Canada's smallest province) joined the Canadian federation under a constitutional agreement that guaranteed ship service to the island in perpetuity.¹⁴ Beginning in the 1880s, there was ongoing debate over whether to substitute a fixed link for a weather-dependent ferry. In early 1988, a plebiscite approved such a link. Later in that year, the federal government selected three bids out of seven proposals for further development. Strait Crossing Development Inc. (SCDI), a consortium of Canadian, Dutch, French and American interests submitted the winning bid.

The selected bid was essentially a BOT agreement. The contract specified a \$41.9 million (1992 Canadian dollars) annual payment from the federal government to the operator, notionally representing the avoided cost of ferry operation. SCDI was entitled to all toll revenues for 35 years, after which bridge operation and ownership of its revenue (and cost) stream would revert to the federal government. The government provided an annual \$13.9 million revenue guarantee. SCDI initially took on most of the construction and operational risk, as well as toll revenue risk beyond the \$13.9 million level. The federal government agreed to bear a number of the residual risks from enemy attack, nuclear catastrophe, earthquake and environmental injunctions and regulatory risk. The federal payment to SCDI was to begin whether or not the bridge was in service in 1997, but if the bridge was not substantially completed, SCDI was required to pay the ferry subsidy. SCDI was required to post performance bonds and guarantees for specific contingencies.

Principal financing was secured in 1993 through the sale of \$640 million real return bonds by Strait Crossing Finance Inc (SCFI). SCFI was established as a special purpose Crown Corporation of the province of New Brunswick. Its bonds were guaranteed by the federal government and received high credit ratings, providing a financial structure sufficiently durable to survive the 1996 pullout of the American private partner, Morrison Knudsen. Fabrication began in late 1993 and the bridge opened in 1997. Initial tolls were set at the ferry price for comparable vehicles and passengers. Annual increases were, and are, permitted at 75 percent of the rate of consumer price inflation. The Canadian government estimated its incremental costs for project management to be \$46 million.

This P3 is clearly a success to the extent that it delivered a functioning bridge on schedule. While there have been weather closures and some unexpected repairs, the bridge itself is functioning as expected, entirely supplanting the prior ferry service. The Canadian government claims that the Confederation Bridge entailed no incremental cost to government and required no direct funding from government. The basis for the claim is the argument that the guaranteed payments to the SDCI are the same as the avoided cost of ferry provision, which the government was constitutionally required to pay anyway. The accuracy of this particular argument depends on the cost of (hypothetical) future ferry service provision.

Because SCFI's bonds are guaranteed by the Canadian government, financial risk has remained largely with government. The bonds were sold at a 4.5 percent interest rate, at a time when similar federal issues were priced at 4.1 percent. Moreover, SCFI paid a sales commission of 1.75 percent, compared to a typical rate of 0.6 percent for federal real return bonds. SCFI's higher rate and fees would not be an issue if the Canadian government had eliminated equivalent risk (in other words, if the federal government had acquired a put-option against the risk of project default) or if the consortium's capital requirement had imposed on the private partners an incentive to minimize project capital. However, because the money was raised by a special purpose government agency and was guaranteed by government, there was no net reduction in risk exposure. It is difficult to escape the conclusion that the structure was primarily chosen in an effort to achieve off-balance sheet financing.¹⁵

The project was completed and put in service very quickly. Again, however, it is not clear that the Canadian government laid-off risks that matched its financial exposure.

U.S. PRISON P3S

This section reviews the evidence concerning P3s in the U.S. prison system based on a number of sources. Admittedly, it is at a highly aggregated level. Some of the earliest private prison arrangements concerned only the delivery of imprisonment services in facilities that were built and owned by government, in other words, standard contracting out. In the 1980s, however, U.S. governments undertook a large prison building program with private sector participation. This

expansion was largely a result of a need to reduce overcrowding: in mid-1991, 40 states were operating prisons in violation of the Constitution's prohibition on "cruel and unusual punishment" (McDonald, 1994; Pozen, 2003). A number of private corporations financed, constructed and operated these prisons. In some cases, there were also lease-buyback arrangements. As a result of this building expansion, the number of prisoners in private facilities grew from 0.5% of all prisoners 8.5% of all prisoners between 1985 and 1997 (Schneider, 1999:196). By the end of 2002, 6.5% of all prisoners (approximately 94,000 in total) were being held in private facilities—12.4% of federal prisoners and 5.8% of state prisoners (Harrison & Beck, 2002:8).

Pozen (2003, p. 72) concludes that "private prisons have a decent if patchy record in the United States." Rates of escape are similar at public and private prisons. Although attempts at cost-comparison have been fraught with methodological problems, most of the empirical studies conclude that the cost of private prisons has been lower than, or similar to, the cost of public prisons: "these studies show a slight advantage to the private prisons and illustrate (in Texas, at least) that a state may realize a reduction in per inmate cost, over time" (Schneider, 1999, p. 201) Many states, including Florida, require private firms to provide services at a cost savings of some specific amount (usually 5-10%).¹⁶ The data on quality as measured on a number of dimensions (administrative compliance, escapes, assaults on staff, vocational programs, etc.) suggest that private prisons are better than, or equal to, publicly operated prisons. Interestingly, Lanza-Kaduce, Parker & Thomas (1999) find lower recidivism rates in private prisons which they attribute to higher completion of rehabilitation programs. McDonald et al.'s (1998, p. 56) survey suggests that prison contract administrators thought that they were generally "getting what they ask for in privately operated prisons." Finally, the presence of private prisons has been credited with helping to improve the cost and quality of public prisons.

LESSONS FROM THE CASE STUDIES

Individual Case Study Lessons

There is one note of caution concerning P3 lessons from these six case studies. Our analysis is based on the availability of public information, whether in journals, newspapers or on the web. Conflict and problems are inherently more newsworthy than cooperation and

everyday delivery of services. Therefore, we would not claim that this is an unbiased sample of P3s. However, these six individual case studies clearly do illustrate many of the difficulties of implementing effective or “successful” P3s that deliver services at lower risk-adjusted total costs than direct government provision or traditional contracting out. As described in the introduction, a major expected benefit of P3s is the private sector’s ability to have lower production costs due to economies of scale, more experience, better incentives and better ability to innovate. However, as we also pointed out, the critical test from a social perspective is whether P3s have lower total costs, including production costs and all the transaction costs associated with managing external suppliers of services.

The case studies illustrate that contracting difficulties make it difficult for the public sector to actually realize lower *total* costs, that is, including all transaction costs. This is not really surprising. P3s are usually complex contracting situations with inherently high transaction costs. Indeed, one way of thinking of P3s is simply government contracting out under relatively unfavorable conditions.¹⁷ Following Williamson (1975), Globerman & Vining (1996) and Boardman & Hewitt (2004), theory suggests that contracting costs are likely to be high when there is asset specificity, complexity/uncertainty, low *ex ante* competitiveness, and poor contract management skills. In these circumstances, after the contract has been signed, contestability will be low, the risk of hold-up will be high and thus the aggregate contracting costs are likely to be high. Many P3s, especially fixed asset infrastructure projects, are likely to have these characteristics.

It is useful to consider the factors that are likely to have raised costs in these case studies. First, we consider the issue of complexity/uncertainty. (Complexity and uncertainty are conceptually different, although in practice they are often treated as a single variable.) Many highway projects are relatively predictable from a construction cost perspective, but are highly uncertain from a usage perspective. For example, there was relatively little problem in constructing the Dulles highway on schedule. However, use levels on the toll road were significantly lower than anticipated (10,000 per day during the initial month versus 34,000 per day projected). This P3 essentially involved bundling a relatively standard highway construction project with a much more uncertain (and complex) operating project that involved demand estimation and pricing expertise. “Bundling” the two projects resulted in

a relatively complex project. The same argument can be made in regards to SR 91. Neither party had experience with variable price electronic tolling in the United States. In contrast, construction of the Tampa Bay water project was complex, while usage demand (and price) was guaranteed. Construction was complex because large-scale desalination is an emerging technology. High complexity of construction resulted in costs that were far higher than expected.

It is generally argued that it is preferable to specify contracts in terms of outcomes or outputs rather than inputs. P3s have special merit in infrastructure provision because imperfect information and the reality of incomplete contracts make it difficult to specify *ex ante* the best design, construction techniques, or even the optimal investment in physical plant as opposed to later operational and servicing costs. In these circumstances, leaving design and investment choices to private agents can be optimal (in providing incentives for innovation and efficient allocation of capital)—provided the public partner can adequately specify the desired service level. However, the Highway 407 case study illustrates how complexity can be increased by specifying performance in terms of outcomes rather than inputs. The lack of specification on the “how” in the RFP was presumably intended to draw our private sector innovation, but it increased complexity substantially. In turn, it had the effect of reducing *ex ante* competitiveness, as indicated by the fact that there were only two qualified bidders.

Second, we consider asset specificity. Many infrastructure P3s are likely to have high asset specificity as such facilities have a high degree of “sunkness”—their value in another use is low or zero. A related critical issue is whether the specific government that has initiated the contract is effectively the sole potential purchaser. In the Tampa Bay desalination plant, the plant was characterized by locational asset specificity and the government was the only possible buyer. The city would not approve the plant and the contractor could not sell the water to any other customer due to its location, thus the contractor was subject to government holdup. Highways also involve locational asset specificity as they cannot be used for anything other than a highway in that location. One would predict that this would lead to a potential problem and, indeed, it has often turned out to be a problem during the construction phase. Here, either side can face the risk of hold-up. The government partner can be held up because it is generally a lot cheaper for the initial contractor to finish the job than to bring in a new contractor. The

existing contractor has a great deal of specific knowledge about the particular project, i.e., there is considerable human capital asset specificity. However, once the infrastructure has been constructed (and approved), the potential problem of asset specificity is reduced because there are many users. In effect, there is a “fundamental transformation”; the situation switches from one of bilateral monopoly to one that is not.

Third, we consider contract management skills. A lack of contract management effectiveness may relate either to the lack of general contracting expertise or to more specific subject-matter expertise. A lack of contracting expertise is a common problem for governments with limited P3 experience. Many public agencies cannot achieve relevant economies of scale and are, therefore, “learning-by-doing” on a steeper part of the learning curve; the result is higher unit cost. This lack of experience tends to encourage opportunism by private sector firms. In the Alberta Special Waste Management System project, BOVAR, the private partner, received a very high guaranteed return on capital. Taxpayers essentially paid twice for the project. Furthermore, the project capacity was too large, having operated at about 50 percent of capacity most of the time. Here, lack of government contract skills led to a contract where the private partner had inappropriate cost incentives.

Opportunism can impact contract management effectiveness in many other ways. If governments are under a political and media microscope, they will be unlikely to “pull the plug” on projects, even if they are failing. Indeed, there may be an escalation of commitment (that is, a tendency to throw good money after bad). It is very hard politically for governments to stop P3 infrastructure projects in the middle—the bigger the project, the harder it is to stop (Ross & Staw, 1993). Of course, this is also true for pure public sector projects (Boardman, Vining & Waters, 1993). If the private sector firm knows the public sector is committed to continuing the project regardless of escalating cost, it has an opportunity to behave opportunistically. But the SR 91 case suggests that governments can also be tempted to behave opportunistically when the private partner is too successful. Government is vulnerable to political charges of having sold-out to, or being duped by, the private partners. This tempts them to renege on contracts, no matter what the financial cost.

In summary, the risk of hold-up is high when uncertainty/complexity and asset specificity are high and contract management effectiveness is

low. This appears to be more likely to happen during the construction phase of P3s, than during the operating phase. While there may be uncertainty during the operating phase, this factor alone may not be too bad. Contestability is often reasonably high and the risk of holdup quite low. If one private sector operator fails, government can bring in another.

Prison P3 Lessons

The evidence suggests that P3 prisons are as cost-effective, or more so, than public prisons. The main reasons appear to be that economies of scale and better cost-containment incentives allow the private sector to operate with lower costs. These advantages do not appear to be offset by the transaction costs that have bedeviled other forms of P3. Contracting costs are reasonably low. There are a number of reasons: the core tasks are not very complex (both in terms of construction and operations), uncertainty is low, asset specificity is low and competition, or at least contestability, is quite high. Complexity is low because the tasks can be specified clearly. Uncertainty is reasonably low because demand is reasonably easy to forecast accurately (there is certainly no shortage of prisoners that require housing!). This also reduces asset specificity and increases competition. In fact, competition is quite high as evidenced by the number of private prison firms that are traded on the stock exchange (Schneider, 1999:196). As a result of these factors, P3s in prisons generally work reasonably well. Of course, there have been some problems in private prisons, including several riots, but these problems also occur in some public prisons.

CONCLUSION: GOVERNMENT BUYER BEWARE

In North America almost any project involving the public and private sectors might casually be referred to as a P3. However, it makes more sense to reserve the term P3 for build, operate and transfer projects. In this article we catalogue the largest and most well-known infrastructure P3s in the U.S. and Canada. Since the mid-1990s they have occurred most frequently in the areas of transportation (roads, airports and bridges), water and wastewater, power and energy, and for hospital and other facilities. The main reasons why governments are drawn to P3s—lower cost provision, lower financial risk, avoidance of up-front capital costs, keeping the budget deficit down, and the ability to impose user

charges—may be valid. But, even if valid, it is important to realize that from a social perspective the key issue is whether the total cost of the P3 is lower than the total cost of the government provision, including production costs and all transaction costs. To investigate this issue we examined six case studies of North American infrastructure P3s.

There has been a tendency by P3 proponents to suggest that they are the Holy Grail that can reduce public sector costs and transfer various categories of risk to private sector actors. But the reality that “there are no free lunches” applies to P3s as much as it does to anything else. The case study evidence is perhaps not surprising: it suggests that profit-making private sector entities, whether they are construction firms, operating entities or whatever, are adept at ensuring that they are fully compensated for risk-taking. In practice, there has been considerable variation in the degree to which financial risk has been shifted to the private sector. In some cases, in spite of the initial intentions of the public partner, projects have ended up largely or completely financed by the public sector. This fact alone should not necessarily stop the public sector from engaging in P3s, but it does suggest that caution and realism are the appropriate attitudes.

Private sector participants will frequently go to considerable length to *avoid* risk, especially those associated with usage, even when that was the primary motivation for the public sector to utilize the P3 form. At the extreme, this means that the private sector will tend to establish “stand-alone” operating firms when carrying out P3 contracts that entail large risks from technological or demand uncertainty. These stand-alone private sector entities can avoid large losses when things go badly wrong by declaring bankruptcy or by *threatening* to go bankrupt. The case studies suggest that the public sector has difficulty in recognizing and anticipating this form of strategic behavior (perhaps because it is something the public sector—with its taxing power—rarely has to deal with).

Unless public sector managers recognize that they must design contracts that both compensate private sector partners for risk and *then ensure that they actually bear it*, P3s will not improve allocative efficiency (make society better off). This article’s purpose is to focus attention on the need for appropriate institutional design.

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NOTES

- ¹ This article builds on, and extends, Boardman, Poschmann & Vining (forthcoming).
- ² For example, the U.S. General Accounting Office (GAO) includes conventional contracting out of government services and even privatization—the complete withdrawal of government provision and financing—as P3s (GAO, 1997). Additionally, the GAO has treated non-profit entities as being “private” sector entities in P3s (GAO, 2004).
- ³ Specifically, we think it does not make sense to include the following relationships as P3s: (1) service contracts or other forms of contracting-out by the public sector; (2) privatization in the form of the sale of public assets; (3) regulation (including franchise contracting) by public sector entities of privately owned natural monopoly facilities; or (4) the construction of facilities by the private sector and the leasing or sale of those facilities to the public sector based upon fixed, certain terms (including lease/purchase or turn-key agreements).
- ⁴ The last point implies that governments cannot borrow infinite amounts without affecting their credit rating. Raising funds for a P3 project may raise the cost borrowing for subsequent projects. Such costs should be included in the “full” cost of the P3.
- ⁵ Vining and Weimer (2004) distinguish between *ex ante* transaction costs, which can be called governance costs, and *ex post* transaction costs, which can be called opportunism costs or hold-up costs.
- ⁶ Hall (1998) quotes the Chief Financial Officer of the private firm that operated the road as saying: “We haven’t made any debt payments in so long I’ve forgotten how much we owe now.”
- ⁷ Assembly Bill 680. This section primarily draws on CBO (1997) and GAO (2004).

- ⁸ Chem-Security said the reasons for this included generators' pursuit of lower-cost options for waste disposal (NRCB, 1994: 6-8).
- ⁹ If Chem-Security and BOVAR could have earned profits higher than the guaranteed rate of return, they would have had an incentive to control costs. However, Mintz (1995: 33 and Appendix) shows that even with some positive probability of profit, the companies would have an incentive to over-invest.
- ¹⁰ Mintz (1995) estimates a weighted return on equity of 15.9 percent for the period 1989 to 1994, far above the risk-free return.
- ¹¹ This section draws on Poschmann (2003).
- ¹² Note that the logic is flawed. The province's taking on of the financing necessarily brought risks and costs not featured in the government's analysis (de Bettignies & Ross, 2004).
- ¹³ Per www.407etr.com, accessed August 28, 2004.
- ¹⁴ This discussion follows Loxley (1999).
- ¹⁵ This was the Auditor General of Canada's conclusion, and the government did not ultimately succeed in keeping the financing off-book (Receiver General for Canada, 1995).
- ¹⁶ Nonetheless, the GAO (1996) concluded that the evidence on cost savings was "inconclusive."
- ¹⁷ As pointed out in the introduction, a (similar) way to think of these projects is as "mixed" enterprises – entities with both government and private shareholders.

REFERENCES

- Averch, H., & Johnson, L.L. (1962). "Behavior of the Firm Under Regulatory Constraint." *American Economic Review*, 52 (5): 1052-1069.
- Batelle Corporation (2003, February). *Performance-Based Contracting for the Highway Construction Industry: An Evaluation of the Use of Innovative Contracting and Performance Specification in Highway Construction*.

- Bartelme, T. (2004, January 5). "A Marriage That Didn't Work," *Journal of Commerce*: 1-2.
- Boardman, A.E., & Hewitt, R. (forthcoming). "Problems with Contracting Out Government Services: Lessons from Orderly Services at SCGH." *Industrial and Corporate Change*.
- Boardman, A.E., Poschmann, F., & Vining, A.R. (forthcoming). "North American Infrastructure P3s: Examples and Lessons Learned." In Hodge, G. and Greve, C. (Eds.), *The Challenge of Public-Private Partnerships: Learning from International Experience*. **Error! Main Document Only.** Cheltenham, UK: Edward Elgar.
- Boardman, A.E., & Vining, A.R. (1989). "Ownership and Performance in Competitive Environments: A Comparison of the Performance of Private, Mixed and State Owned Enterprises," *Journal of Law and Economics*, 32 (1): 1-34.
- Boardman, A.E., Vining, A.R., & Waters, W.G. II (1993). "Costs and Benefits Through Bureaucratic Lenses: Example of a Highway Project," *Journal of Policy Analysis and Management*, 12 (3): 532-555.
- Boardman, A.E., Mallery, W.L., & Vining, A.R. (1994). "Learning From *Ex Ante/Ex Post* Cost-Benefit Comparisons: The Coquihalla Highway Example," *Socio-Economic Planning Sciences*, 28 (2): 69-84.
- Broadbent, J. & Laughlin, R. (2004). "Perils of Partnership," *Australian CPA*, 74 (4): 56-58.
- Brumback, T. (2003, December 4). "SCC Weighs Toll Road Rate Ceiling," *Leesburg Today*.
- Congressional Budget Office (1997). *Toll Roads: A Review of Recent Experience* (CBO Memorandum). Washington, DC: Author.
- de Bettignies, J-E., & Ross, T.W. (2004). "The Economics of Public-Private Partnerships," *Canadian Public Policy*, 30 (2): 135-154.
- Eckel, C., & Vining, A.R. (1985). "Elements of a Theory of Mixed Enterprise," *Scottish Journal of Political Economy*, 32 (1): 2-94.

- “A Troubled Water Odyssey” (2003, October 31). *St. Petersburg Times*: 14A.
- Flyvberg, B., Holm, M.S., & Buhl, S. (2002). “Underestimating Costs in Public Works Projects: Error or Lie?” *Journal of the American Planning Association*, 68 (3): 279-293.
- Globerman, S., & Vining, A.R. (1996). “A Framework for Evaluating the Government Contracting-Out Decision With an Application to Information Technology,” *Public Administration Review*, 56 (6): 40-46.
- Gregory, R., & Borland, J. (1999). “Recent Developments in Public Sector Labor Markets.” In O. Ashenfelter and D. Card (Eds.), *Handbook of Labor Economics* (Vol. 3C) (pp. 3573-3630). Amsterdam, The Netherlands: North-Holland.
- Grout, P.A., & Stevens, M. (2003). “The Assessment: Financing and Managing Public Services,” *Oxford Review of Economic Policy*, 19 (2): 215-234.
- Hall, T.C. (1998). “Red Ink Floods Greenway,” *Washington Business Journal*, 17 (18): 1-2.
- Hambros, S.G. (1999, March). “Public-Private Partnerships for Highways: Experience, Structure, Financing, Applicability and Comparative Assessment. Objective One: Final Report” (Report to the Council of Deputy Ministers Responsible for Transportation and Highway Safety). Ottawa, Canada: Transport Canada.
- Harrison, P.M., & Beck, A.J. (2003). “Prisoners in 2002,” *Bureau of Justice Statistics Bulletin*. Washington, DC: U.S. Department of Justice. [On-line] Available at <http://www.ojp.usdoj.gov/bjs/pub/pdf/p02.pdf> (Retrieved 26 August 2004).
- Hundley, G. (1991). “Public- and Private-Sector Occupational Pay Structures,” *Industrial Relations*, 30 (3): 417-34.
- Jensen, M.C., & Meckling, W.H. (1976). “Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure,” *Journal of Financial Economics*, 3: 305-360.

- Johnson, N. (2003, January 6). "As Seawater Desalination Plant Readies for Day 1, Eyes Turn to Tampa," *Knight Kidder Tribune Business News*.
- Lanza-Kaduce, L., Parker, K.F., & Thomas, C.W. (1999). "A Comparative Recidivism Analysis of Releases from Private and Public Prisons," *Crime and Delinquency*, 45 (1): 28-47.
- Lapre, M.A. & Van Wassenhove, L.N. (2003). "Managing Learning Curves in Factories by Creating and Transferring Knowledge," *California Management Review*, 46 (1): 53-72.
- Loxley, S.J. (1999). "An Analysis of a Public Private Sector Partnership: The Confederation Bridge" (A Report Prepared for the Canadian Union of Public Employees). Canada: Canadian Union of Public Employees.
- McAfee, R.P., & McMillan, J. (1989). *Incentives in Government Contracting*. Toronto, Canada: University of Toronto Press.
- McDonald, D.C. (1994). "Public Imprisonment by Private Means: The Re-Emergence of Private Prisons and jails in the United States, the United Kingdom, and Australia," *British Journal of Criminology*, 34 (1): 29-48.
- McDonald, D.C., Fournier, E., Russell-Einhorn, M., & Crawford, S. (1998). *Private Prisons in the United States: An Assessment of Current Practice*. Washington, DC: Abt Associates Inc.
- Mackie, R. (2004, August 12). "McGinty Shrugs Off Highway Toll Spat," *Toronto Globe and Mail*: A4.
- Meggison, W.L. & Netter, J.M. (2001). "From State to Market: A Survey of Empirical Studies of Privatization," *Journal of Economic Literature*, 39 (2): 321-89.
- Mendoza, E., Gold, M., Cater, P. & Parmar, J. (1999). "The Sale of Highway 407 Express Toll Route: A Case Study," *Journal of Project Finance*, 5(3): 5-14.
- Mintz, J.M. (1995, October). "An Evaluation of the Joint Venture Agreement Establishing the Alberta Special Waste Management

- System” (Mimeo). Toronto, Canada: University of Toronto Faculty of Management.
- Natural Resources Conservation Board (1994, November). “Receipt of Hazardous Waste from Other Canadian Jurisdictions by the Alberta Special Waste Management System” (Decision Report: Application #9301 - Chem-Security (Alberta) Ltd.). Calgary, Canada: Natural Resources Conservation Board.
- Norment, R. (2002). “PPPs-American Style,” *The PFI Journal*, 39: 26-27.
- Pae, P. (1995, December 26). “Drivers Put the Brake on Toll Road’s Promise,” *Washington Post*: A1, A18, A19.
- Pittman, C. (2004, March 16). “Contractors Differ Over Cost to Fix Desal Plant,” *St. Petersburg Times*: 1B.
- Poole, R.W. Jr. (2000, April 23). “Caltrans Had No Choice But Make Deal with 91 Express Lane Firm,” *Los Angeles Times (Orange County Edition)*: 13.
- Poschmann, F. (2003). “Private Means to Public Ends: The Future of Public-Private Partnerships,” *C.D. Howe Institute Commentary 183*, Toronto, Canada: C.D. Howe Institute.
- Pozen, D.E. (2003). “Managing a Correctional Marketplace in the United States and the United Kingdom,” *Journal of Law and Politics*, 19: 253-84.
- Priest, G.L. (1993). “The Origins of Utility Regulation and the ‘Theories of Regulation’ Debate,” *Journal of Law and Economics*, 36 (1), Part 2: 289-323.
- Receiver General for Canada (1995). “Public Accounts of Canada, 1995. Volume 1.” Ottawa, Canada: Canadian Government Publishing.
- Roll, M. & Verbeke, A. “Financing of the Trans-European High-Speed Rail Networks: New forms of Public-Private Partnerships,” *European Management Journal*, 16 (6): 706-713.
- Rosenau, P.V. (1999). “Introduction: The Strengths and Weaknesses of Public-Private Policy Partnerships,” *American Behavioral Scientist*, 43 (1): 10-34.

- Ross, J. & Staw, B.M. (1993). "Organizational Escalation and Exit: Lessons from the Shoreham Nuclear Power Plant," *Academy of Management Journal*, 36 (4): 701-732.
- Schneider, A.L. (1999). "Public-Private Partnerships in the U.S. Prison System," *American Behavioral Scientist*, 43 (1): 192-208.
- Taliaferro, R. Jr. (1997, September 28). "Greenway Runs into Financial Troubles," *Richmond Times Dispatch*: A-17.
- Teisman, G.R., & Klijn, E-H. (2002). "Partnership Arrangements: Governmental Rhetoric or Governance Scheme," *Public Administration Review*, 62 (2): 197-205.
- Trailer, J.W., Rechner, P.L., & Hill, R.C. (2004). "A Compound Agency Problem: An Empirical Examination of Public-Private Partnerships," *Journal of American Academy of Business, Cambridge*, 5 (1/2): 308-315.
- U.K. National Audit Office (NAO). (2003). *PFI: Construction Performance* (Report by the Comptroller and Auditor General, HC 700, Session 2002-2003). London: HMSO.
- U.S. Government Accounting Office (GAO). (1996). "Private and Public Prisons: Studies Comparing Operational Costs and/or Quality of Service," Washington D.C.
- U.S. Government Accounting Office (GAO). (1999). "Privatization: Lessons Learned by State and Local Governments," GAO/GGD-97-48, Washington D.C. Report to the Chairman, House Republican Task Force on Privatization.
- U.S. Government Accounting Office (GAO). (2003). "Federal-Aid Highways: Cost and Oversight of Major Highway and Bridge Projects—Issues and Options, GAO-03-764T." Washington, D.C. Testimony before the Subcommittee on Transportation, Treasury and Independent Agencies, Committee on Appropriations, House of Representatives; Statement for the Record by JayEtta Z. Hecker, Director, Physical Infrastructure Issues.
- U.S. Government Accounting Office (GAO). (2004). "Highways and Transit: Private Sector Sponsorship of and Investment in Major

Projects Has Been Limited.” Report to Congressional Requesters, GAO-04-419, Washington, D.C.

Vining, A.R. & Weimer, D.L. (2004). “Economic Perspectives on Public Organizations.” Forthcoming in D.L. Ferrin, L. Lynn and M. Pollitt (Eds.), *Oxford Handbook of Public Management*. Oxford: Oxford University Press.

Williamson, O.E. (1975). *Markets and Hierarchies: Analysis and Antitrust Implications*. New York: The Free Press.

Wooldridge, S.C., Garvin, M.J., Cheah, Y.J. & Miller, J.B. (2002). “Valuing Flexibility in Private Toll Road Development: Analysis of the Dulles Greenway,” *Journal of Structured and Project Finance*, 7(4): 25-36.

Wright, A.G. (2003). “Desalination Dispute Leaves a Bitter Taste; Judge Orders Tampa Bay Water and Covanta to Name a Mediator to Work Out Plant Dispute,” *ENR*, 251(23): 12.