

The Theory and Practice of Infrastructure Public-Private Partnerships Revisited: The Case of the Transportation Sector

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Introduction

Around the world, public-private partnerships (PPPs) have become increasingly popular to deliver many types of public infrastructure, including transportation projects, hospitals, schools, prisons and waste and water treatment facilities. This paper focuses specifically on the transportation sector, which is the type of infrastructure that has seen the greatest number of projects delivered through PPPs (Public Works Financing, 2011). Between 1986 and 2011, 1,300 highways, bridges, railways, urban transit lines, seaports and airports have been built or rehabilitated through this project delivery model, with a capital value of over \$650 billion. PPPs represent an important form of multi-level governance, involving complex relationships between different government agencies and departments, and various private sector firms that serve as project advisors, construction contractors, operators and insurers.

PPPs are widely promoted based on a narrative of improved collaboration between different stakeholders. By aligning the interests of the multiple parties to encourage closer and more productive working relationships, it is argued that public-private partnerships support innovative project designs and deliver value for money by better controlling project risks. Despite the promises, however, relationships between the various partners in PPPs have often turned from collaborative to confrontational, threatening the success of the project.

This paper unpacks the complicated partnership relationships that underpin PPPs in the transportation infrastructure sector. The transportation sector provides fertile ground for both theoretical and applied insights on the practice of PPPs, due to the long history and widespread use of PPPs in the sector, as well as the application of PPP models that are commonly used across different types of infrastructure globally. The paper begins by defining the structure of the relationships between the various public and private sector partners in a PPP, and categorizes the incentives in place for each partner. Then examples of mega-projects delivered globally are presented to identify key tension points that can arise between the various partners. The paper concludes by reflecting on the factors that support successful partnerships in the context of multi-level governance arrangements.

Why Partner in the First Place

Public-private partnerships are guided by a simple belief: that governments and firms working in meaningful collaboration will deliver mega-projects that have better outcomes than any one party could deliver on their own. “Not only have they [PPPs] become seen as a cost-efficient and effective mechanism for the implementation of public policy across a range of policy agendas” writes Stephen Osborne (2000, 1), an early proponent of PPPs. “[T]hey have also been articulated as bringing significant benefits in their own right- particularly in terms of developing socially inclusive communities.”

For Ronald McQuaid (2000, 9), the benefits of a partnership approach comes specifically from “a recognition that any one local actor often does not have all the competencies or resources to

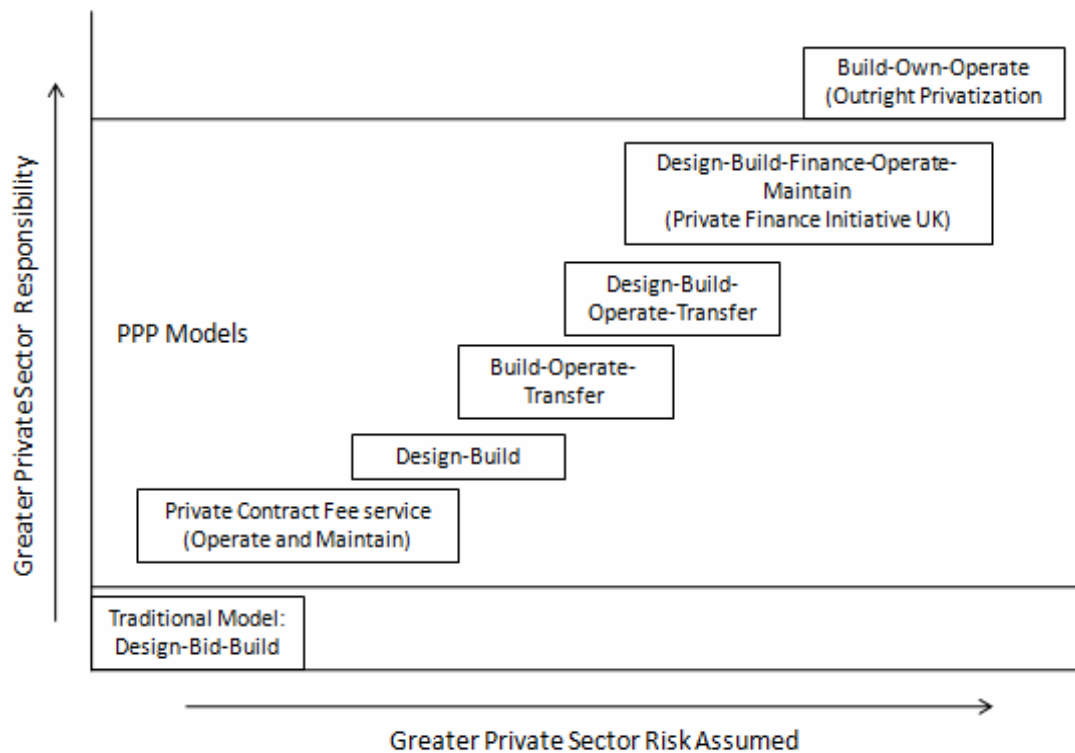
deal with the interconnected issues raised in many policy areas.” Rather, because of the interdependence between different actors involved in the successful delivery of an infrastructure mega-project, the strength of the partnership approach is derived from the aligning of interests between the partners. “Our central proposition is that the PPP is a strongly incentive-compatible contracting arrangement” argue Grimsey and Lewis (2004, 6). “The cost effectiveness of a PPP relative to traditional procurement is a result of upfront engineering of the design solution and the financing structure combined with downstream management of project delivery and the revenue streams. All of this is a consequence of the incentives built in to the services payment mechanism and the risk transfer in the PPP model.” Thus, for PPP proponents, maximizing the benefits of multi-level governance is formally interwoven directly into the fabric of the PPP.

While PPPs may be based on a belief in the benefits of partnership, the structure of the relationships between multiple government and private sector partners are anything but simple. The planning and delivery of infrastructure mega-projects has always involved partnerships between governments and private sector firms. These partnerships have taken a variety of different forms. Dating back to the nineteenth century, for instance, the French government used concession style arrangements to contract private firms to build roads and exclusively operate them over a specified period of time, recouping their investment through toll charges; likewise the first turnpikes in the United States were built and operated by private firms under exclusive concession agreements with the governments of the day. In Canada in 1881, the nascent national government contracted a private firm to build, own and operate the strategically important TransCanada Railroad, in exchange for a small upfront public investment, a massive land grant and a 20 year deferral of property taxes. Developing countries have also extensively partnered

with private sector firms to deliver transportation infrastructure. In Mumbai, India, the construction of the Princess Docks in the 1870s was conceived by the quasi government Bombay Port Authority, financed through a public bond issue by the national government, and competitively tendered and built by a private sector contractor. These varied examples highlight how partnerships between the public and private sectors in the delivery of critical infrastructure are not new (Garvin, 2010; Wettenhall, 2010).

In contemporary infrastructure project delivery, as shown in Figure 1, partnership structures of all kinds are still used, and range on a spectrum from greater public sector responsibility to greater private sector responsibility. A current definition of PPPs has three dynamics: first, there is a long-term contractual arrangement between the public and private sector to deliver an infrastructure facility where mutual benefit is sought; second, the private sector is involved in some combination of facility design, construction, financing, operations, and maintenance; third, each partner shares in the potential risks and rewards associated with the delivery of the project (Garvin, 2010).

Figure 1: Contemporary PPP Models



(Source: CCPPP, 2007)

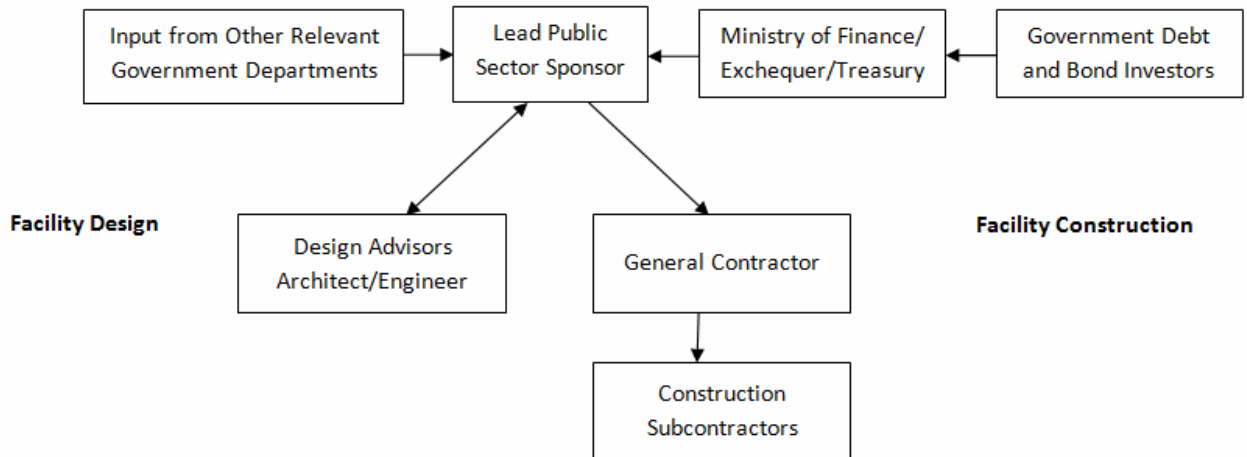
PPPs are thus a formalized, contract based approach to long-term partnership. While the term ‘public-private partnership’ implies a fixed partnership between a single public sector entity and private sector firm, in fact neither the public nor private sector is monolithic. On the contrary, both the public and private sectors are comprised of complex partnerships between a range of organizations and actors. As will be shown below, the structure, terms and incentives built into these relationships are of central importance in understanding both the patterns of investment at a global scale, the types of projects that are most typically delivered, and the success of an individual PPP project within its local environment. In order to contextualize the inter-organizational dynamics that accompany the PPP, it is helpful to first review the partnership approach used in the traditional model of project delivery, and the types of challenges that have commonly arisen.

The Traditional Project Delivery Approach

The traditional public sector led model of project delivery used in the transportation sector is known as the Design-Bid-Build (DBB) approach. This procurement model is highly disaggregated and sequential in the way that inter-organizational interdependencies are managed. The facility is designed by a government agency in collaboration with a team of consultants. The government agency then initiates a competitive bidding process to select a separate team of construction contractors to build the facility to the specifications. Lowest cost is often the primary criteria used to select the winning bidder, and in fact in many cases this is mandated by law. Construction is funded directly by the government agency through public debt or bonds, and the facility is operated by public sector employees (Siemiatycki, 2006). On transit projects, repayment of some public borrowing for capital costs may come from transit fares, but the bulk is typically funded through general tax revenues. On road projects, tolls may cover some or all of the initial capital costs as well as operating expenses.

In the traditional model of contracting, as shown in Figure 2, there are four main parties involved in a DBB project: the lead project sponsor, typically a government department, ministry or agency; the construction contractor, which may be comprised of a consortium of firms and subcontractors; the engineering advisors to the government; and the financial lenders. Each of the main parties involved in a DBB project have their own unique set of objectives and interests, some of which overlap and others of which are in conflict.

Figure 2: Typical Organizational Structure of a Design-Bid-Build Procurement



For the lead project sponsor, their primary objective is to deliver a project that has the lowest up front construction costs, and meets the needs of their stakeholders. Complementing the lead project sponsor are typically agencies and departments representing other levels of government, who may have some jurisdictional responsibility, or may be brought on board to participate as funding partners. For the lead project sponsor and their government partners, the DBB approach is seen to be advantageous because they maintain a high level of input and control over the evaluation of project alternatives, facility location, alignment, design and finishes. In some jurisdictions, it is legally required that infrastructure projects are procured using the DBB method. In practice, a challenge with the DBB approach has been that governments have often selected the lowest cost construction option, rather than the design that maximizes long-term value. “We tend to cheap it out” under the DBB approach, a senior public sector project manager from Canada explained in an interview, “because we go through an exercise, of almost inevitably, value engineering the project towards the end to meet a budget and we take out a lot of the good to have things.”

The objective of the contractor varies from that of the government agency; it is to turn a profit on the construction of the project. This can be achieved by delivering the project on time and on budget which can sometimes be rewarded by a bonus payment. Additionally, once a fixed price contract for the construction work has been signed, the contractor has an incentive to use every technique available to manage risk and lower delivery costs in order to maximize their profit. Because the contractor does not have a long-term stake in the project following construction completion, building the facility quickly and at a low cost may supersede quality considerations. Moreover, because the engineering design was developed and signed off by the government agency and not developed with input from the contractor, there may be trouble with the handover, and the contractor has an incentive to submit change orders for any miscalculations or required deviations that add to the cost of construction. The cost of accepted change orders are paid by the government sponsor.

The engineering advisors to the project sponsor have a similar motivation to earn a profit on the job. Yet their profit is rooted in providing what is seen to be a complete work plan and a high quality service to the government agency. A project that is well designed and functions well upon completion can serve as important exposure and help the engineering advisor to win future work. To this end, the engineering advisors have an incentive to collaborate with the winning contractor to see the successful realization of their plans, especially if they are retained by the public sector agency to oversee the project's construction phase. Yet collaboration may turn to confrontation if there are disputes about whether costly change orders originated with the contractor or errors rooted in the original engineering designs.

Government lenders are the final party involved in a DBB procurement. Debt financing that is used to fund infrastructure capital costs typically comes through the government's normal borrowing facility and is not tied to a given project. When this is the case, the lenders have little incentive to vet the priorities, merits or outcomes of any given project. Lenders will lend money to government regardless of their specific investment choices, provided that they are confident of being repaid. Thus the lenders are not particularly concerned about the viability of any given transport project or its outcomes, as long as they are convinced that the government has the capacity to repay their overall loan.

Within this constellation of involved parties and their interests, projects delivered through the traditional model of infrastructure delivery have faced a similar set of challenges. These include persistent cost overruns, construction delays, poor workmanship and operational performance shortfalls (Flyvbjerg et al., 2003; Van Wee, 2007). The cause of these challenges has been attributed to various factors rooted within the disaggregated structure of the relationships between the public and private sector partners. Siemiatycki (2009) found that a common challenge is the lack of coordination between the project designers and facility builders early in the project delivery process leading to incomplete designs and costly change orders. For Flyvbjerg et al (2007) and vanWee (2007), poor outcomes are more commonly the result of the inappropriate allocation of risk to the partner that is best able to manage them, and opportunistic behavior on the part of project promoters and developers where mechanisms are not in place to align short and long-term interests.

Finally, the level of government involved in funding the project can create perverse incentives in project selection, location and design decisions. As Pickerell (1991) shows, there is a strong incentive for local promoters to underestimate project costs and overestimate project benefits in order to be competitive and attract funding from senior levels of government. Projects funded directly by government can be sited to maximize political benefit with limited regard for demand, efficiency or operating cost recovery. Facilities can also be overdesigned or overbuilt at significant additional costs, often to limit the harm to surrounding communities that may oppose the scheme. With funding coming from senior levels of government, there are strong incentives for local project planners to select expensive technologies that have capacities in excess of what can be justified based on expected ridership, or choose costly underground transit alignments to limit unpopular impacts at surface level (Altshuler and Luberoff, 2003).

The PPP Model

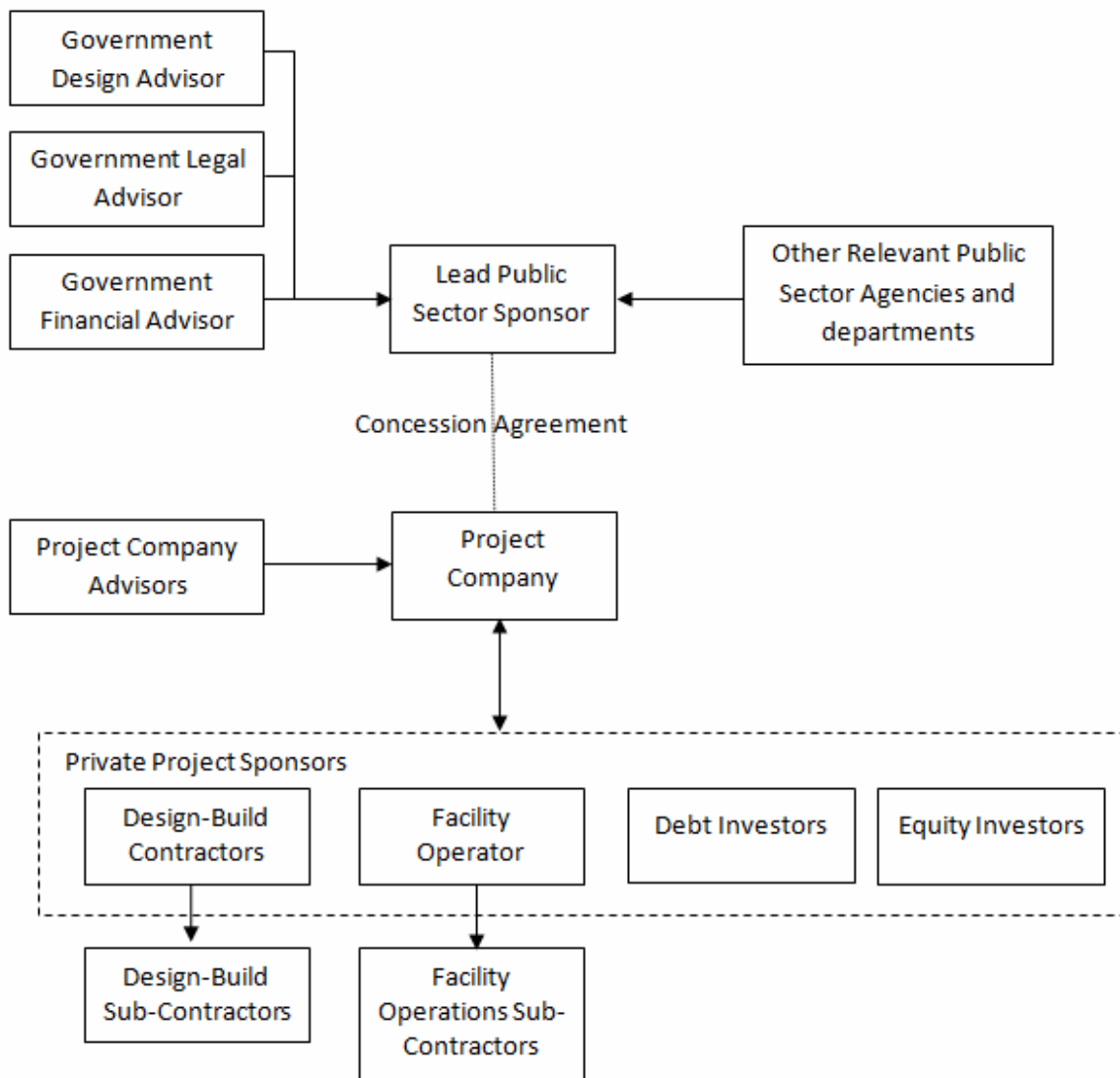
In theory, public-private partnerships are designed to overcome the persistent challenges that have faced traditionally delivered public works projects, by capitalizing on the relational networks and social embeddedness of governments and firms participating in complex mega-projects. The emphasis in this paper is on concession style PPP models that bundle some combination of facility design, building, financing, operation and maintenance into a contract with a single concessionaire. In return, the concessionaire either collects all user fee revenue or is paid an annual fee over the life of a long-term contract lasting between 25 and 99 years. Provided that the facility is constructed on budget and operates as planned, the annual payment or user fee

revenue collected by the concessionaire is sufficient to cover capital costs, maintenance and operational expenses, and a margin of profit (Smyth and Edkins, 2007).

This bundled approach to infrastructure project delivery is meant to deepen early and ongoing cooperation between the partners so that their interdependence is of an increasingly reciprocal nature (Smyth and Edkins, 2007; Teicher et al., 2006). Accountability and performance is increased among the project partners by better linking financial reward with ongoing project performance, particularly when annual payments to the concessionaire are generated entirely through user fees (Flyvbjerg et al. 2003).

While PPPs have evolved and been adapted to suit their particular project context, each project continues to be delivered through a relatively similar set of underlying arrangements (Yescombe, 2007). As shown in Figure 3, PPPs are delivered through relationships between governments and many firms that act for both the public and private sector partners. As in the DBB model, the different parties involved in a PPP each have their own objectives and interests in participating in the partnership, some of which are complementary and others that may be in conflict. Briefly outlining these interests highlights some of the similarities and differences between the traditional DBB and the concession style PPP approach.

Figure 3: Typical PPP Concession Structure



The Public Sector Sponsor

For the public sector, one agency or department usually serves as the lead public sponsor (also known as the commissioning agency), which commonly receives input from other levels of government, agencies and departments that have an interest in the area. Additionally, while a common objective of the PPP model is to raise private sector financing for infrastructure, it is not

uncommon for the public sector partners to directly fund up to two thirds of the cost of the project through public debt. As such, even as PPPs emphasize the partnership between the public and private sectors, they continue to be shaped by important dynamics of multi-level government collaboration.

In the PPP model of project delivery the role of the public sponsor is shifted from a producer and provider of infrastructure to a purchaser of public services that meet a pre-specified set of output based performance standards. To this end, the PPP approach is for the public sponsor to develop a set of performance specifications and then invite private sector bidders to submit proposals that best meet the specifications at the lowest cost. The winning bid is selected based on its potential to deliver the best value over the project's lifecycle rather than strictly the lowest construction cost. One feature of the PPP process is therefore that the public sponsor and its government partners have less control over the specific project design, construction methods, and finishes, provided that the best value proposal meets the performance specifications. Over the course of the long-term operating period, an important objective for the government partner is to maintain some control over key project planning responsibilities such as the setting of service levels, quality and safety standards, user fee rates, and facility expansion plans. These are critical government responsibilities that contribute to protecting the public interest. At the same time, the political party in power can become vulnerable to public outcry in cases where control has been contractually transferred to the private sector partner, enabling unpopular decisions by the private sector partner (Siemiatycki, 2010).

The Public Sector Advisors

For the lead public sector sponsor as well as other levels of government involved, executing a DBFOM project typically involves hiring multiple firms to serve as independent financial, insurance, legal and design advisors throughout the procurement process, who themselves may subcontract work to other specialist firms (Grimsey and Lewis, 2004; Reeves, 2008). The role of external project advisors have become particularly significant as governments have increasingly outsourced all aspects of the transportation project procurement process to private sector consultants and contractors (Gen and Kingsley, 2007). Within this context, many project sponsors, especially smaller agencies or governments that do not procure large projects regularly, feel that they do not have the specialized expertise necessary to structure and execute a successful project. The hiring of specialized expertise is thus seen by project sponsors as a way to level the playing field in terms of information and expertise when dealing with experienced private sector partners, and ensure that the public sector partner is making decisions and drafting concession agreements that best protect the public interest.

Like in the DBB model, advisory firms are compensated based on a fee for service basis. Their objective is to generate a profit through their advisory services, and their services do not come cheaply; advisory services and transaction costs commonly account for between 1% and 3% of the total capital cost of a mega-project. Given the lucrative nature of the PPP advisory business, these firms have an interest in seeing projects proceed successfully as PPPs and the PPP model further adopted locally and abroad, since this could position them for future commissions with either the public or private sector partners (Hodge et al., 2010; Shaoul et al., 2007).

The Private Sector Partner

Like the public sector partner, the private sector structure for being involved in a PPP brings together a variety of different parties, through a complex set of arrangements. At the core of the private sector's involvement in the PPP is a special purpose vehicle (SPV) or project company. A new project company is formed for each PPP project by a consortium of sponsor firms that have been selected as the successful bidders, and the project company then enters into contractual arrangements with the commissioning agency, key subcontractors, and investors. This legal structure ensures that any private lending to the project company is not counted on the balance sheet of the individual firms that comprise the project company. The parent firms of the SPV are also insulated from being financially responsible for covering project losses or bankruptcy (Shaoul et al., 2008).

In the typical private sector consortium, the lead sponsor of the project company is a large construction contractor or engineering firm, and the consortium team is rounded out with sponsoring firms that have specialized expertise in facility operations and maintenance, as well as project financing. The project company also hires specialized legal, financial and technical advisors on a fee for service basis, to complement their own in-house staff in the production of the bid and delivery of the project. In this model, the project sponsors often serve as the key project delivery subcontractors, who then further subcontract work to other firms. As a commitment to the project and its successful delivery, the firms sponsoring the project company typically each make an initial equity investment amounting to a total of approximately 10% of the private sector's expected contribution (anywhere from one third to one hundred percent of

the project's capital costs). This means that they face losing their own capital if the project is not financially viable.

With their own risk capital at stake, in theory the firms that comprise the project company are strongly incentivized to develop innovative project designs, construction strategies, and operational plans that minimize costs over the entire lifecycle of the project, since their initial investment is repaid in installments over the long-term operating period. Additionally, the integration of facility design and construction alongside facility operations and maintenance into the private sector's bundle of services is meant to incentivize the production of more complete initial designs, limit errors in the hand off of project from the designer to the builder, and create strong financial incentives to manage construction risks, and deliver the project on time, on budget and to a high quality.

For the concessionaire, then, their objective in the contract with the public sector sponsor is to try and lock in as many project contingencies as early on in the planning process as possible. This enables the concessionaire to identify and price project risks appropriately, and then manage them over the course of the construction and operating contract. To this end, concessionaires have demanded strict contractual terms that limit direct competition for the service, pre-specify toll rates and escalation schedules, and levy severe penalties for government initiated breach of contract, even though such measure conflict with the public sponsor's objective of maintaining their long-term control and flexibility over the project and associated policy decisions.

In practice, the theoretical incentives built into the concession agreement have not always delivered their desired outcomes. Equity financing carries a high cost premium, so project sponsors have often accepted small equity contributions in order to make the PPP financially competitive with traditional procurement. An observed pattern has been that some members of the initial project delivery consortium have sold their equity stake in the project early, limiting the long-term incentives built into the PPP model. Moreover, the project company may have an incentive to prioritize design and architectural mediocrity over excellence to save on costs. And tested technologies may be prioritized over innovations or building flexibility into project designs, since these can add costs and increase the risk of penalties if they do not meet the initial performance specifications.

The Private Investors

While members of the project company commonly invest up to 10% of the private sector's contribution in equity, the remaining 90% of the private sector's upfront funding contribution is raised from debt investors or through the floating of bonds. This private sector financing is organized by a series of bank arrangers that serve as intermediaries (Grimsey and Lewis, 2004; Wall and Connolly, 2009). Tapping into global capital markets can be an expensive way to finance public infrastructure projects. In the transit sector, for instance, privately raised capital typically comes with a premium of between 100 to 200 basis points above the rates available to governments, adding some \$20 - \$40 million in borrowing costs per \$100 million borrowed privately over a 35 year term.

While private sector borrowing carries a cost premium, the presence of private sector financiers is identified as an important contributor to value for money in the PPP model. It is expected that the presence of private financiers with their own risk capital on the line will bring a greater level of scrutiny and discipline to the planning, delivery and operation of a project. Unlike in the DBB approach, private sector investors are investing specifically in a project, and their return is based to varying degrees on the success of the project. When the contract stipulates that investors are repaid entirely through collected user fees, the investors have a strong incentive to scrutinize the ridership forecasts and project plans at the outset, countering some of the overly optimistic rationales and projections that may be put forward by project promoters that do not have the same personal “skin in the game.”

Even if the private investors are repaid directly through government payments based on the facility being available and performing to the expected standards, the contracts can be structured to align the interests of the public sector partner and the investors. This is especially around achieving an on time and on budget project. When the contracts specify that the private sector partner does not begin receiving government payments until the project is completed, the investors are incentivized to closely scrutinize the project delivery team to ensure that the project is built on time and on budget, and they can intervene to demand changes in process or management if results are not meeting expectations.

Tension Points in PPP Planning

As illustrated in the preceding discussion, PPPs in the transportation infrastructure sector have not tended to be designed as joint venture, hybrid public-private organizations with the sharing of resources and strategic decision making at their core. They rather are structured in such a way so that they keep the organizations, roles and responsibilities of the public and private sectors quite separate. To this end, many scholars argue that these contemporary models of project delivery are not truly partnerships at all. “To a large extent, public-private partnerships are still more rhetoric than reality” write Klijn and Teisman (2000, 183). “Several projects are presented as partnerships, but in many cases a closer look shows the centrality of government and the lack of creative interaction.”

Despite questions about the depth and meaningfulness of the partnerships in the infrastructure sector, the long-term contractual arrangements constituting PPPs are specifically intended to align the risks and rewards for each partner involved in an infrastructure project. This makes the firms comprising the project company, its investors, and the public sector partners highly interdependent. Indeed, it is clear that a successful PPP is based on managing the interdependencies of public and private sector organizations involved in a complex mega-project (Flyvbjerg et al., 2003; Siemiatycki, 2009). In PPPs the relationship between the partners is specified in a concession agreement, which often stretches over thousands of pages, and lays out each party’s roles and responsibilities over the course of the long-term partnership.

However, in practice, PPPs are living, breathing agreements, sensitive to all of the risks and uncertainties of planning in contexts characterized by competing interests and change over time. Against this backdrop, in the vast body of literature on PPPs, scholars and practitioners have

identified a number of key tension points where the theory of partnership meets the messiness of planning practice. The following section identifies some of these key tension points associated with delivering transportation infrastructure through PPPs, and explains them by focusing on the multi-level governance models and public-private interrelationships that underpin the partnership.

Do PPPs Support Sustainable Transportation?

A first issue relates to the very types of transportation infrastructure that are conducive to being built through PPPs. Around the world, governments of all levels are grappling with the challenge of how to finance and successfully deliver the next generation of sustainable transportation infrastructure, to address issues of climate change, air pollution, automobile dependence, and diminishing supplies of easily accessible hydrocarbons. Broadly put, governments have defined sustainable transportation to mean ways of moving around that limit pollution emissions and draw on renewable resources, are affordable and equitable in their access, and support economic growth and prosperity. Common examples include public transit, carpools, and car sharing, as well as active modes of transport like cycling and walking. For cities and countries that have been designed to encourage long distance travel and automobile usage, at the core of this transition towards more sustainable transportation are investment in public transit mega-projects, including both large scale urban rapid transit lines and interurban railroads.

Increasingly, both national and local governments in countries as diverse as Canada, the United States, Britain, South Africa, Brazil and India are holding up PPPs as a key strategy to expedite

and expand investment in sustainable transportation projects. PPPs, the governments argue, make it possible to tap into private sector capital and expertise to realize sustainable transportation projects sooner and more efficiently than if left to more traditional government funding and delivery models. Given the interest in using PPPs to deliver sustainable transportation, an important question is therefore whether PPPs are actually conducive to such projects? Or do the partnership structures and the allocations of project risks embedded within contemporary PPP models make sustainable transportation projects less feasible?

At the simplest level, the global experience to date suggests that there are challenges in using PPPs to deliver sustainable surface transportation projects. Globally between 1984 and 2010, more than five times as many road projects were delivered as PPPs than rail schemes. In cities, moreover, 70% of all urban transportation PPPs delivered globally have been roads, bridges and tunnels that support greater dependence on the automobile, compared with just 30% of projects being urban and commuter rail lines that provide viable travel alternatives to the automobile. Western Europe is the sole region where PPPs have been successfully used to deliver a critical mass of transit mega-projects (see Public Works Financing, 2010; World Bank, 2010). In the cities in developing countries, by comparison, PPPs have been particularly skewed towards auto oriented projects, especially ring roads and upgraded connections to urban-satellite towns around the periphery of the major cities. These investments provide the road space that supports hyper-mobility for the growing ranks of the middle class, increased goods movement by truck, and rapid land use development and industrialization at the periphery of major urban centres. They also contribute to increased auto-dependence, air pollution and traffic congestion (Newman and Kenworthy, 1999).

The relatively limited use of PPPs to deliver large scale sustainable transportation projects are rooted in the incentives built into the PPP delivery model. First, transit projects often require approvals and funding from overlapping levels of government, making them dependent upon collaboration between agencies that can have significantly different interests. Conversely road projects are more likely to be the sole responsibility of a single government agency or department such as a highway agency or department of transport, making it simpler to proceed. Second, sustainable transportation projects often require ongoing capital and operating subsidies from governments to make them financially viable. This makes sustainable transportation projects more difficult to gain commitments for than road projects that may be financeable from toll revenue alone or through other motor vehicle taxes.

Third, large rail projects are typically extensions of existing lines or are facilities that are deeply integrated across a region and benefit from system wide coordination, rather than freestanding greenfield infrastructure that may be more typical of new road schemes. This level of interconnectedness limits the level of risk transfer and innovation that can be brought to bear through deeper private sector participation and the unbundling of individual lines from the transit system. Recent planning for a \$22 billion investment in rail projects across Los Angeles provides a case in point. County officials were keen to exploit the benefits of the PPP to successfully realize their once-in-a-generation investment in sustainable transportation infrastructure.

However, a feasibility study exploring the prospects of using PPPs to deliver this investment found that such an approach would provide little additional value, because of 1) challenges integrating private and public operations and maintenance on the same line, 2) a busy urban

environment with complex geotechnical issues that limits meaningful risk transfer; 3) a heavily unionized environment that challenges transferring facility operations to the private sector (Schneider, 2012). Due to the limitations of the PPP model in this context, the investment is being examined for delivery through more traditional government procurement models.

While PPPs may have limited application for large scale urban rail projects, the implementation of road tolling on new or upgraded road facilities provides an additional perspective on the environmental and social implications of PPPs. Road tolls have been widely implemented on PPP projects in Latin America, South East Asia, North America and Australia. Over the past decade, Western Europe has seen an expansion of road PPPs that do not include user tolls (Silva, 2000), but Britain, Spain and Portugal are now reconsidering toll based concessions to limit the use of direct government funding for new roads. Road tolls are significant from an environmental sustainability perspective, as they serve to manage growing demand for road usage. Nevertheless, ‘there is an inherent dilemma in tolling specific stretches of roads’ write Patel and Bhattacharya (2010, 68). ‘[T]he application of the concept of excludability, the cornerstone of user charges, is problematic in both moral and economic terms.’ While the excludability of road tolls can be reduced if revenues are used to cross subsidize investments in alternative modes of travel (Ubbels and Nijkamp, 2002), PPPs reduce the possibility of redistribution when revenues are kept by the concessionaire. In one often cited example, rapid toll rate escalation on Greater Toronto’s Highway 407 PPP has contributed to managing travel demand in a busy transportation corridor. But healthy profits from the higher toll rates have been internalized with the private concessionaire and no cross subsidy for transit or other travel alternatives have been made available (Keil and Young, 2008; Torrance, 2008).

Meaningful Public Engagement in Project Planning

A second key tension point relates to the processes of planning large scale infrastructure through PPPs, and whether the differing interests of the public and private sector partners enable meaningful public consultation and community engagement in project planning. It is now well understood that transparency and public involvement in the PPP planning process are key links between project planning and the wider democratic decision-making process, as well as an important mechanism to ensure that selected projects achieve their stated objectives (Shaoul et al., 2010; Siemiatycki, 2006).

Despite a broad consensus on the benefits of creating systems to ensure accountable decision making as part of the PPP procurement process, public and private sector project sponsors have also highlighted the need to keep certain information confidential during the procurement process. The core of this tension is succinctly captured by Hedlund and Chase (2005):

"On the one hand, disclosure of proposed projects is necessary for them [PPPs] to gain public legitimacy. On the other hand, the private sector will be unwilling to participate if certain information about them and their business secrets must be disclosed"

The rationales for keeping information confidential vary at different stages of the procurement process, as does the partner that encourages the withholding of key information. Early in the

planning process, the public sector partner benefits from the withholding of sensitive information. In the typical PPP procurement, the public project sponsor publishes a set of performance specifications that the private sector bidders are required to meet with their project designs. Beyond the performance specifications, public sector agencies have often withheld extensive information around preferred construction methods, specific technologies and designs, detailed budgetary information, and assessments of the project's value for money as a PPP. The limited release of this information is meant to preserve the greatest incentive for private sector innovations, limit allegations of biasing the tender outcome, and maintain the public sector sponsor's negotiating position with the winning bidder.

During the competition to select the winning bidder, the need for confidentiality is primarily related to ensuring the integrity and fairness of the bidding process, and protecting the commercial position of the participating bidders. Since a robust competition is seen as central to the achievement of innovative and cost-effective projects in the PPP model, strict rules are put in place to make the tendering process attractive to bidders, and ensure equal treatment of all participants in the competition. In particular, the government entity conducting the tendering process is usually not permitted to release commercially sensitive bidder information that divulges innovative system designs, corporate strategies, delivery mechanisms, or project financing models and expected rates of return. The release of such information may dissuade some concessionaires from submitting a bid if they are concerned about providing a competitive advantage to a rival firm. Thus, the precise details about each bid are not commonly released publicly during the planning process, limiting the extent to which the public can meaningfully provide feedback and assess the merits of major public infrastructure projects.

Finally, during the selection and contractual negotiations with the winning bidder that comprise the last phase of the PPP planning process, some argue that confidentiality may strengthen the bargaining position of the public sector negotiators as they seek a contract that delivers the greatest level of public benefit. It is suggested that the public release of certain information, such as exactly what public funds are available or which system features can be cut in order to save costs, could influence the negotiation tactics of the private sector and therefore ultimately lead to less effective projects.

Despite the legitimate need to maintain confidentiality of commercially sensitive information in certain contexts, the Australasian Council of Auditors General (1997) raised questions about the motivations for restricting access to information:

“Recent experiences in Australia would indicate that Government agencies are tending to use the pretext of commercial confidentiality as a shield against the disclosure of information which is commercially embarrassing to the Government or which raises issues of probity.”

The issues of secrecy and confidentiality during project planning processes have become one of the key public critiques of PPPs, as politicians and citizens seek to assess whether the PPP model provides value for money in their community. As an opposition party politician in Ontario articulated in an interview, his top concern with PPPs is “accountability, first and foremost, and

transparency through the process for the investments on the public side. I think that it does hide the true costs on projects to the public at large.”

Indeed, concerns about the adverse impacts of limited accountability and transparency have been highlighted in some recent experiences with transport PPPs. In California, for instance, residents in Orange County protested vigorously when it was discovered that a previously undisclosed non-competition clause in a PPP contract restricted the government from undertaking a necessary expansion of a highway adjacent to the SR-91 express toll lanes that had been delivered by a private concessionaire. And in Vancouver, a protracted law suit was initiated by a business owner after it was announced that the winning concessionaire for an underground rail line had chosen to build the system using an invasive cut and cover construction method, rather than a less disruptive deep bore tunneling approach as expected. As illustrated, limited transparency can affect not only the planning process but also the political risks and successful outcome of a project.

On-time and On Budget? At what cost

A third key tension point in PPP project delivery is the extent to which such models of project delivery successfully control unexpected cost escalations, and at what cost. On large scale infrastructure projects, risk tends to be concentrated in two stages of the project: construction, and demand and operations. In recent years, governments procuring transportation infrastructure have identified on time and on budget project delivery as the key motivation that drives the use

of PPPs. Indeed, the extent to which PPPs provide value for money to the public largely hinges on transferring construction period risks to the private sector partner.

Historically, transportation mega-projects delivered through traditional procurement models have been plagued by large construction cost overruns and late project delivery, which have often been covered by contractor claims for additional government investment (Flyvbjerg et al, 2003; vanWee, 2009; Siemiatycki, 2009). By involving the private sector earlier in the project planning process, bundling facility design and construction into a single contract, creating tight legal agreements, and bringing on board investors who only recoup their investment when the project is completed, PPPs have been proposed as a way to create incentives that clamp down on the underlying causes of cost overruns. As Bain (2007, 6) argues, while conflicts between partners over costly change order claims have been common in traditional procurement, in PPPs “[t]he incentive for contractors to complete has replaced the incentive to claim.” Thus for the public sector partner, budget certainty is the central benefit of proceeding with a PPP procurement, rather than the elimination of cost overruns so long as they are borne by the private sector concessionaire.

To date, the limited empirical research that is available suggests that PPPs have had success in limiting major construction cost overruns being passed on to the public sector partner. The largest comparative study from researchers in Australia suggests that PPPs have had fewer incidences of cost overruns and construction delays than traditionally built projects (Allen Consulting Group, 2007). Siemiatycki (2010) shows that construction cost overruns were not a major outcome on three early PPPs, the Croydon Tramlink, the State Route 91 express lane PPP

in Los Angeles, and the Cross City Tunnel in Sydney, Australia. And in Canada, governments in Ontario and British Columbia boast that the PPP model is revolutionizing project delivery, with every major PPP (both transportation and other large buildings) approved since 2003 being achieved on time and on budget. As the head of the British Columbia agency responsible for delivering PPPs proclaimed,

“All B.C. public private partnerships (PPPs) to date have been delivered on time and on budget. Performance-based, fixed-price contracts ensure that cost and schedule overruns don't happen and that project risks are transferred to the private partner. Taxpayers don't pay for a design that doesn't work or for a service that isn't provided to the contractually bound standards set by government.” (Blain, 2009, 1)

While proponents of PPPs have trumpeted their success in delivering cost certainty for governments, critics have questioned at what cost these results are being achieved? In one of the few detailed studies to break down the financial performance of PPPs, Acerete et al (2009) examined the first eight DBFO road PPPs in the UK, and concluded that private sector partners were recouping outsized profits from their participation in PPPs.

“Its private sector partners reported a post tax return on capital of 29% and an effective cost of capital of 11% in 2002, more than twice the UK cost of public finance (approximately 4.5%), a high price for risk transfer.” (Acerete et al., 2009, 20)

Beyond high returns, Boardman et al (2005) note that while the private sector has become skilled at ensuring that they are well compensated for taking on risk, they have gone to considerable lengths to transfer costs back to the public in cases when conflicts arise and things go wrong. The structure of the private concessionaire as a special purpose vehicle means that the parent companies face limited recourse if the concession collapses and bankruptcy is declared. Members of the concession team have also limited their equity participation in PPPs by extensively relying on financial leverage and third party financing. Thus risk transferred in theory may not always be risk transferred in practice.

Conflict between the Partners

A final point of tension in PPPs is the prevalence of conflict between the public and private sector partners. Despite the widely held belief that PPPs are predicated on the formation of trusting long-term relationships between the public and private sector, conflict between the partners has been a common aspect of PPPs. Conflicts in PPPs are rooted in the differing interests and incentives that various partners have in a project. This is not altogether surprising as the stakes can be very high. Even minor changes to the contract terms can be the difference between profits or loss for the private sector concessionaire, or additional government subsidies. Additionally, PPPs tend to cover high profile public infrastructure projects. As such public sector dealings with the concessionaire are replete with political risks for the government in power. On the one hand, governments may be the ultimate holder of all financial risks if a strategically important project goes bankrupt (Shaoul et al., 2010). On the other, they may face intense public

criticism if they are seen to be protecting corporate interests over those of facility users and the general public.

To be certain, disputes in PPPs have arisen over which partner should bear the costs for unexpected construction cost escalations. However, the dominant source of conflict in transportation PPPs have related to facility demand and service quality over the long-term operating period of the concession. On early transportation PPPs, public sector sponsors sought to transfer risks associated with lower than expected traffic volumes and poor service quality to the private sector partner. This was achieved through the application of free standing PPPs, in which all private sector capital investment and operating costs were recouped directly through user fees. Examples of free standing transportation PPPs include the Croydon Tramlink in London, the Orlyval rail shuttle to Orly Airport near Paris, the State Route 91 express toll lanes in Orange County California, Highway 407 in Toronto, the Cross City Tunnel in Sydney Australia, the Bangkok Skytrain and Kuala Lumpur rapid transit projects, and the Las Vegas Monorail.

Yet these projects have faced common challenges, and as a World Bank study on PPPs bluntly reports, ‘allocating all demand risk to private operators has a poor track record’ (Menzies and Mandri-Perrott, 2010, 2). First, traffic volumes and revenues on transportation PPPs have often failed to meet expectations, challenging the financial viability of the concessionaire, and contributing to demands by the private sector partner to renegotiate the terms of the PPP relationship. As Estache and Serebrisky (2004) show, over half of all highway PPP concessions

in Latin America between 1985 and 2000 were renegotiated within the first three years of the concession, often leading to additional costs or risks assumed by the public sector partner.

Second, contractual clauses designed to protect the long-term revenues of the private sector investors have resulted in governments losing control over fee setting and system wide planning, functions that are key to protecting the public benefit of infrastructure projects. Non competition agreements are a feature of some road PPPs, restricting where governments can build future infrastructure facilities. PPPs concessions have also sometimes included contractual terms that lock in long-term decisions that may not be acceptable to future governments, and result in conflict and in some cases legal actions. In the case of the Cross City Tunnel in Sydney, an incoming government faced public pressure to drop the toll rates and reverse some road closures that accompanied the project. However, the concessionaire criticized these efforts in the press as “politically expedient”, violating the terms of the partnership agreement and threatening the financial success of the project (Trioli, 2006).

Third, competing interpretations of service level and facility maintenance agreements have been a source of conflict between the partners. In London, Mayor Ken Livingstone publicly criticized the Croydon Tramlink concessionaire for not providing sufficient service frequency leading to overcrowding on parts of the system, and letting the infrastructure fall into disrepair which resulted in formal improvement notices issued by the Office of Rail Regulation (Livingstone, 2007). The mayor also publicly criticized the national government for imposing expensive transportation PPPs on the British capital, and mused about tasking his staff with exploring

options to bring PPP concessions back in house. The war of words between the partners was carried out publicly in the media, and resulted in a deterioration of any trust in the relationships.

Not surprisingly, the contract management costs associated with remediating conflicts have been high for one or both of the partners. However, one surprising aspect of early transportation PPPs has been the number of projects that have been cancelled or gone bankrupt before the scheduled conclusion of the concession period. As examples, the Croydon Tramlink, SR-91 express toll lanes and the Orlyval rail shuttle were each bought out by the public sector partner in order to facilitate improved service quality and system-wide integration. At the same time, the original concessionaires involved in the Las Vegas Monorail and Cross City Tunnel have each gone bankrupt, resulting in efforts to restructure the services under private sector control.

As a result of the poor track record of transportation PPPs that transfer traffic volume and operations risk to the private sector, governments and investors have become increasingly reticent to participate in PPPs that involve the transferring of all traffic volume risk to the private sector. In response, one adjustment that has been made in recent years is the move towards PPP models that pay the concessionaire a guaranteed annual payment provided the facility is available and meeting performance criteria. Under such models, the public sector partner can maintain control over the setting of user fee rates and regional planning objectives. Terms are also included in some concessions so that if profit or traffic volume exceeds or falls below a certain level, the contract is rebalanced to compensate the losing partner. The inclusion of rebalancing provisions in contemporary transportation PPPs provide an incentive for both the

public and private sector partners to continue to collaborate throughout the partnership, while removing some of the key sources of conflict that have challenged the viability of PPPs.

Conclusions

As illustrated in this paper, public-private partnerships are an important form of multi-level governance, bringing together partners from both the public and the private sector to deliver infrastructure mega-projects. In theory, incentives built into the PPP contracts that structure the multi-party collaboration are designed to align the interests of the partners and encourage project results that are better than any one party could achieve on their own. In practice, PPPs have had mixed results: the prospect of construction cost certainty for the government partner is balanced off against high financing and transaction costs, limited applicability to date in the sustainable transportation sector, meaningful public consultation that has been undermined by the incomplete release of key project information, and frequent tensions between the partners.

To be certain, PPPs are not a static model of project delivery. Just as partnerships between the public and private sector have always existed in the provision of public infrastructure and have evolved over time, growing awareness of the shortcoming of PPPs provide an opportunity for innovation to address these contemporary challenges. Already, innovations in PPPs have begun to take place. For instance, the growing popularity of PPP models that repay upfront private sector investment through availability payments rather than user fees have made urban transit projects more viable, particularly in North America. Such approaches have also reduced the need for controversial contractual clauses that limit the long-term flexibility of governments to set user fee rates and make planning decisions that provide public benefit. PPP planners have also

taken steps to make the planning process more transparent, releasing the complete concession agreements and summary documents on project value for money once an agreement is finalized. Indeed, it is now not entirely uncommon for more information to be publicly available about PPPs than traditionally procured projects. And more robust dispute resolution protocols are being built into PPP concession agreements that mandate non-legal remedies for conflicts between the partners, with legal proceedings identified as a last resort.

Despite the advancements in PPP models and project delivery approaches, pressing challenges still remain. While PPPs have grown in popularity, they still face stiff opposition from communities concerned about creeping privatization, loss of long-term public control over key public assets, and the loss of democratic input and accountability over critical infrastructure investment decisions. A key question emerging from this research is thus whether there is a benefit in finding more hybrid, joint venture models of organizing infrastructure public-private partnerships that encourage deeper and more meaningful collaborations between the partners? Or is the public interest better met from evolving procurement arrangements that maintain clearly separate roles between the partners? Only by continuing to evolve and meeting the identified challenges head on will PPPs remain an effective model of infrastructure mega-project delivery in the transport sector.

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