

Successful Delivery of Public-Private Partnerships for Infrastructure Development

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Abstract: Two common approaches have been used by governments for the implementation of public-private partnerships (PPPs): a finance-based approach that aims to use private financing to satisfy infrastructure needs, and a service-based approach that aims to optimize the time and cost efficiencies in service delivery. The implementation of PPPs, however, may suffer from legal, political, and cultural impediments. In the United States, the federal government enabled a number of acts to ease the impediments and promote PPPs for infrastructure development. Based on a detailed analysis of PPPs in the United Kingdom and British Columbia, Canada, this paper describes principles that would characterize the implementation of PPPs at the program level (e.g., whether the implementation is successful). The principles pertain to the: availability of a PPP legal framework and implementation units; perception of the private finance objectives, risk allocation consequences, and value-for-money objectives; maintenance of PPPs process transparency; standardization of procedures; and use of performance specifications. Guidelines for successful implementation are explained and discussed in the context of the United States PPPs experience and impediments.

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Introduction

Traditionally public infrastructure has been delivered by the public sector using the design-bid-build procurement system. With the increased demand for new developments and for maintaining existing infrastructure, public funding resources were unable to keep pace with the demand (Augenblick and Custer 1990; FHWA 2005a). Public-private partnerships (PPPs) were sought as alternative delivery systems to address some of the funding problems. PPP arrangements were utilized extensively and found considerable acceptance in several parts of the world. A Public Works Financing database of worldwide projects between 1985 and 2004 shows that 1,121 PPP infrastructure projects (road, rail, airport, seaport, water, and building), representing \$450.9 billion worth of investment, were funded and completed with the majority of the projects being in Europe, Asia, and the Far East as shown in Table 1 (FHWA 2005c). To keep pace with the growing numbers of PPPs, substantial literature and guidelines were published to further explain the administration of the procurement process, selection of contractors, and evaluation of proposals (WB 1998; UNIDO 1996; ADB 2000; EUC 2003; Tiong and Alum 1997; Zhang 2004).

Several arrangements of PPPs have been utilized including the common build-operate-transfer (BOT), and its variants such

as build-transfer-operate (BTO), design-build-finance-operate (DBFO), build-own-operate (BOO), design-build-operate-maintain (DBOM), and several others (Miller 2000; Zhang and Kumaraswamy 2001). Also, design-build (DB) is frequently considered a form of PPPs. These arrangements were used in varying degrees among countries worldwide. Table 2 shows the distribution of the PPP arrangements for \$322.4 billion worth of road projects planned since 1985, with the BOT/BTO/concession projects being the most widely used. Table 3 shows the regional distribution of the different PPP arrangements used in road projects, with Europe as the leading region that utilizes and promotes the greatest number of PPP arrangements (FHWA 2005c).

While there are several PPP arrangements, two general approaches could be identified for how governments implement PPPs. The first represents a finance-based approach that aims to use private financing to satisfy the infrastructure needs. It relies on user fees and project demand to fund projects. The earliest types of PPP were predominately finance-based, and included BOT, BTO, and BOO arrangements (WB 1998; UNIDO 1996; Kumaraswamy and Morris 2002; Zhang and Kumaraswamy 2001).

The second government approach is service based. Under this approach, the objective is to use the skills, innovations, and management of the private sector to optimize the time and cost efficiencies in "service" delivery. An example of this approach is the DBFO arrangements of the United Kingdom and British Columbia where the goal of delivering better services (e.g., transportation service) led to the development of projects that are funded mainly through government sources, with or without user fees, while still using private financing. The statistics in Table 3 indicate that Europe and Asia/Far East have significantly used both the finance and the service-based approaches, and that Europe has the highest usage of the service-based DBFO arrangement. North America's implementation of PPPs has been less extensive and

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Table 1. Regional Share of PPP Projects Funded and Completed between 1985 and 2004 (Adapted from FHWA 2005c)

Region	Percentage (%)
Europe	37.8
Asia and the Far East	36.7
North America	15.8
Latin America, Africa, Middle East	9.7
Total (\$450.9 billion)	100

the DB/DBOM arrangements have been highly preferred to the BOT/BTO/concession arrangements.

The United Kingdom is considered a model country for its use of PPPs to develop schools, hospitals, prisons, roads, and defense facilities. Harris (2004) mentioned that the massive worldwide interest in PPPs can be traced back to the experience of the United Kingdom. An important point that Harris mentioned was that some countries which claimed to have PPPs were in fact using PPPs only in a limited manner to deliver certain functions, not as a structured program. The United Kingdom has a broad experience with several types of PPP procurement modes and payment mechanisms. Initially the United Kingdom employed usage-based, direct toll, build-own/operate-transfer (BOT, BOOT) contracts in the late 1980s [e.g., Channel Tunnel (HMSO 1986), and Second Severn Bridge (UKDOT 1986)]. Later, after the initiation of the private-finance-initiative (PFI) in 1992, it expanded to the use of shadow-toll DBFO contracts, performance-based DBFO contracts, and congestion active-management DBFO contracts. Similarly, the PPP program in British Columbia, Canada, has used PPPs to develop projects in several sectors and has also used the DBFO service-based-approach. The British Columbia PPP program is similar to that of the United Kingdom.

Although governments may have showed considerable interest in PPPs, the system experienced impediments in its implementation. Zhang (2005b), through a questionnaire survey that targeted China, United Kingdom, and other countries, identified general barriers for PPPs including: (1) social, political, and legal risk; (2) unfavorable economic and commercial conditions; (3) inefficient public procurement framework; (4) lack of mature financial-engineering techniques; (5) problems related to the public sector; and (6) problems related to the private sector.

Similarly in the United States, while the federal government has shown considerable interest in PPPs, the system suffered from a number of impediments. PPPs were sought by the federal government as a tool to fill the funding gap for infrastructure development. The US Federal Highway Administration (FHWA) indicated that the projected federal, state, and local highway revenues between 2003 and 2014 were 40% less than the investment requirements needed to maintain and improve the highway facili-

Table 2. Contractual Arrangements in Planned PPP Road Projects between 1985 and 2004 (Adapted from FHWA 2005c)

PPP Arrangement	Percentage (%)
BOT/BTO/Concessions	65
DB/DBOM	24
DBFO	10
BOO	1
Total (\$322.4 billion)	100

Table 3. Regional Distribution of PPP Arrangements for Road Projects between 1985 and 2004 (Adapted from FHWA 2005c)

Region	BOT/BTO/Concession	DBFO	DBOM/DB
Europe	44.6	58.1	31.9
Asia and the Far East	27.2	31.1	20.3
North America	16	3.5	43.6
Latin America, Africa, Middle East	12.2	7.3	4.2
Total (\$322.4 billion)	100	100	100

ties (FHWA 2005a). Another report by the FHWA indicated that the average annual investment requirements for 2003–2022 would exceed by 8.3% the 2002 spending (\$68.2 billion) if only the cost of maintaining highways and bridges was considered, and would exceed 2002 spending by 74.3% if capital improvements were considered (FHWA 2004).

At the United States federal level, PPPs have been promoted since the 1991 Intermodal Surface Transportation Act (ISTEA), which was in turn followed in 1998 by the Transportation Equity Act for the 21st Century (TEA-21), and finally with the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) in 2005. For PPPs, the intent of these acts was to encourage private sector participation in highway infrastructure projects and to provide project financing opportunities to the states. Examples of the federal support include: (1) credit assistance such as Transportation Infrastructure Finance Innovation Act (TIFIA) credits, loans (Section 129 Loans) and State Infrastructure Banks (SIB); and (2) Grant Anticipation Revenue Bonds (GARVEEs). SAFETEA-LU provided further provisions to allow states to toll interstate highways, expand private activity bonds, expand TIFIA, SIB, and use design-build contracts (FHWA 2005c). At the state level, some states such as California, Colorado, and Virginia, have promoted and authorized PPP projects prior to ISTEA, however, many of the legislations followed the ISTEA and its financing opportunities. To further promote and standardize PPP procurement practices, the American Bar Association developed the 2000 model procurement code (ABA 2000) which was enacted by 18 state legislatures (Miller 2000). In addition, the FHWA (2007) produced a working draft of PPP legislation so that states would consider it when developing their own PPP legislation.

The federal and state efforts provided for several PPP arrangements to be used. Between 1985 and 2004, of the \$41.5 billion worth of PPP road projects, 71% were DB/DBOM, 26% BOT/BTO/concessions, and 3% BOO and management contracts (FHWA 2005c). Of the DB/DBOM projects, 74% were toll highways and 26% were nontoll roads. Other arrangements used in the United States included tolling of existing highway lanes (e.g., high occupancy toll lanes, HOT) and selling of existing highway assets (long-term lease, privatization). The proceeds from the tolls and asset sales were used by a number of states to raise funds needed for road repairs and expansion, adding new roads, and relieving congestion (FHWA 2006; Reason 2006). Examples include the sale of the 99-year Chicago Skyway for \$1.8 billion in 2005, the 75-year lease of Indiana Toll Road for \$3.85 billion in 2006, and the 99-year lease of Virginia's Pocahontas Parkway in 2006 ("U.S. and Canada transportation scorecard 2006").

Despite the United States initiatives, the implementation of PPPs has been facing difficulties. A 2004 report to the Congress explained that "the use of these partnerships often encounters

obstacles including legal, financial, political, and cultural hurdles" (USDOT 2004). Two main impediments included:

1. State laws and policies
 - a. Lack of state PPP legislation;
 - b. Lack or discontinuity of public-sector leadership: political champions for PPPs may enter and leave office throughout the course of a project, creating uncertainty for the private-sector partners; and
 - c. Traditional procurement has been quite satisfactory: states and local governments have relied on the traditional low-bid procurement method which most contractors are comfortable with, yet this system does not favor a life-cycle cost approach to projects.
2. Local opposition
 - a. Lack of local community support: generally, the public resists the use of tolls. Furthermore, state and federal officials have a history of commitment to "free" roads particularly when there is public opposition.

Another FHWA (2005b) report covering PPP implementation in seven states mentioned six PPP impediments: (1) lack of statutory authority to enter into PPPs; (2) lack of familiarity with the mechanisms for developing and implementing PPP projects; (3) bureaucratic government processes for environmental review, right-of-way acquisitions, and project contracting; (4) cultural differences between the public and private sector interests; (5) opposition by transportation program administrators/staff; and (6) lack of dedicated revenue sources/innovative financing tools to enable projects to be developed.

The perception of the private sector (contractors, consultants, and PPP full-service providers) about the impediments of PPPs in the United States was established through a survey as part of the research by Abdel Aziz and Kangas (2007). The findings of the survey indicated that more efforts are needed in enabling and stabilizing PPP legislation, developing PPP guidelines, developing strategies to address the public stakeholders, clarifying the tax requirements, managing the timelines of the selection process, and clarifying the ownership of the intellectual property rights.

Considering the impediments cited above, one could argue that the success of PPP implementation is contingent on the initiation and management of PPPs at the program level. This paper explains a number of principles that would characterize the implementation of PPPs at the program level. The principles were derived mainly from the analysis of the United Kingdom's and British Columbia PPP experience. First, along with the types of impediments mentioned above, this paper analyzes the critical success factors at the PPP program level. Second, it examines the PPPs program structure and documentation in the United Kingdom and British Columbia. Third, this paper analyzes concession agreements and project documentation of several PPP transportation projects in British Columbia. The paper concludes with a number of guidelines suggested for the implementation of PPPs at the program level. The guidelines are explained within the context of the United States PPP experience and impediments.

Critical Success Factors at PPP Program Level

Development of projects using PPP delivery systems requires adequate preparations at both the PPP program level and the project level. Previous research identified, through questionnaire surveys, interviews, and case studies, the critical success factors (CSFs) that contribute to the successful delivery of PPP projects at the program level. Li et al. (2005) identified 19 CSFs for PPP projects

in the United Kingdom construction industry. The following were program level specific CSFs: (1) appropriate risk allocation; (2) transparency in the procurement process; (3) good governance; (4) political support; (5) sound economic policy; and (6) well-organized public agency. Harris (2004), reflecting the United Kingdom experience, mentioned a number of program-related CSFs including: (1) effective procurement process; (2) effective management and transfer of risk; (3) clear specification of outputs; (4) public sector project affordability; (5) process standardization; and (6) well-defined contracts. Ahadzi and Bowles (2004) investigated the attributes that affect the efficiency of the PPP process in the United Kingdom. One category of the attributes that was related to the government side included: (1) technical capabilities, e.g., the ability to establish project parameters and in-house expertise; (2) organization capabilities, e.g., commitment and level of collaboration with the public sector team; and (3) financial capabilities. Zhang and Kumaraswamy (2001) examined practices in the United Kingdom, United States, China, and some developing countries and identified critical issues for improving PPP protocols; some of the issues at the program level included: (1) suitable legal foundation; (2) workable procurement process; (3) coordinating and supportive authority; and (4) realignment of public mind sets. Zhang (2005a) identified and analyzed 47 CSFs and classified them into five categories, two of which were related more to PPP program level: (1) favorable investment environment and (2) appropriate risk allocation. Zhang (2005b) suggested a nine-area protocol which mainly addressed PPPs at the program level: (1) appropriate roles of government authorities; (2) best value-for-money approach; (3) effective management of advisor services; (4) formulation of appropriate schemes; (5) use of relational contracts; (6) improvement of procurement framework; (7) payment structure; (8) contract monitoring, termination, and step-in rights; and (9) transfer management.

Principles for PPP Implementation

Following a detailed analysis of: (1) the United Kingdom and British Columbia's PPP program structure, initiatives, and documentation; (2) request for qualifications (RFQ), request for proposals (RFP), concession agreements, value-for-money reports of several BC's PPP projects; and (3) the PPP impediments and CSFs, a number of principles were identified to be important in characterizing the implementation of PPPs at the program level. These principles are related to the:

1. Availability of PPP institutional/legal framework;
2. Availability of PPP policy and implementation units;
3. Perception of private finance objectives;
4. Perception of risk allocation and contractor's compensation;
5. Perception of value-for-money;
6. PPP process transparency and disclosure;
7. Standardization of PPP procedures and contracts; and
8. Performance specifications and method specifications.

The importance of these principles could be understood in light of an analogy for how a business goal is achieved; the goal being to implement PPP. First, two fundamental elements need to be established: (1) a business unit, e.g., PPP unit, that would carry out the implementation activities (e.g. choosing a PPP arrangement, selection of contractors, and preparation of contract documents); and (2) a legal framework, e.g., law, policies, and processes, within which the business unit would work (e.g., law authorizing tolls on public highways). However, to successfully

achieve the implementation goal, the business unit needs to acquire knowledge about the “market” within which it works, for example: (1) knowing the different financing options and their implications on the projects; (2) knowing how the risks are allocated between the parties and the consequences of the allocation; and (3) knowing how to assess the value of the projects under various conditions. In addition, for a public business unit to excel in its work, it would need to go further in: (1) establishing transparency measures about how decisions are made; (2) standardizing the work practices and procedures to achieve efficiencies; and (3) developing new tools to run the business (e.g., the use of performance specification against prescriptive specifications).

Other elements could also contribute to a successful PPP implementation. For example, Harris (2004) explained the need for high-level political support, addressing staff concern of losing jobs, need for the press to promote PPPs, prioritization of projects, and need to choose project sectors for which it is possible to develop a service based on output specification.

Institutional/Legal Framework

The legal framework establishes the limits within which the government units work. For example, the early PPP acts were enabled with specific conditions including for example: regulating project ownership, authorizing the use of specific PPP mode (e.g., BOT and BTO), authorizing the use of tolls, limiting private sector freedom in toll setting, authorizing specific projects (e.g., pilot projects), and/or authorizing the use of PPPs for a specific period of time (Abdel Aziz and Russell 2001). Early PPP projects in the United Kingdom, Canada, and the United States experienced such conditions; examples include the Second Severn Bridge project, United Kingdom (UKDOT 1992), Channel Tunnel, UK/France (UKDOT 1987), Confederation Bridge, Canada (GOC 1993), Highway 104, Canada (NSDOT 1995a), and the SR 91, United States (Assembly Bill No. 680, Chap. 107, State Transportation Facilities, California 1989). Recent acts of some United States have broadened the scope of acts to cover more than the specific conditions; examples include the revised Virginia Public Private Transportation Act, PPTA (VDOT 2005) and “Washington State SHB 1541 Transportation Innovative Partnerships Act” (Olympia, Washington, 2005).

Streamlining PPPs in a jurisdiction requires institutionalizing the practice at the different levels of government. United Kingdom’s and British Columbia’s experience show that the implementation of PPPs starts with initiatives or acts that authorize and regulate the use of PPPs for the delivery of public infrastructure. Guidelines and policies would then be developed to interpret the initiative and to provide tools that standardize the implementation at the different government levels. Without guidelines, it would be difficult to institutionalize PPPs for infrastructure development.

With the existence of initiatives, acts, and guidelines, streamlining PPP implementation is best realized when the government capital planning process realizes the wide spectrum of delivery systems that could be used for project development, and that the choice of one system over the others should be based on the best value for taxpayer’s money. Examples include the United Kingdom, Victoria (Australia), and British Columbia’s frameworks which require capital projects in transportation and other public services to be evaluated for PPP delivery before a procurement decision is made and the decision to be based on the best value-for-money (HCL 2003; Translink 2002; PV 2001a,b).

In the United Kingdom, the PFI has grown to a comprehensive system with guidelines and policies that details the requirements for contract management, project financial structure, payment mechanism, and value-for-money assessments, as well as monitoring and evaluation of the PFI projects for performance evaluation of the delivery system itself (HMT 2003a,b, 2004a,b,c,d; HMTF 2003a,b; NAO 1999; OGC 2002a,b). In Victoria, Australia, the PPP initiative was established in 2000 and several guidelines were developed including PPP framework and contract management guide (PV 2001a), contractual risk allocation guide (PV 2001b), development of public sector comparative (PSC) (PV 2003a), determination of discount rates and inflation rates for value-for-money assessments (PV 2003b, 2005b), and managing interest rate risk (PV 2005a). In 2002, British Columbia released its Capital Asset Management Framework (CAMF), a comprehensive guideline for procurement of capital assets and services, which requires departments, e.g., transportation, to be innovative in the delivery of public services and to consider traditional as well as PPP options when determining the most appropriate method for meeting and satisfying public need (Capital asset management framework 2002).

The institutional framework needed to support PPPs within a jurisdiction requires development of guidance not only to central government departments but also to local governments and authorities. In the United Kingdom, such support was provided through the establishment of the 4Ps public-private-partnership-program which assists local authorities and accelerates the development, procurement and implementation of PFI schemes for the different sectors such as schools, waste management, transport, street lighting, and housing (PPPP 2005). In British Columbia, a similar effort was made to support the use of PPPs at the municipal level through amendments to the Municipal Act and development of guidance reports (Public-private partnership 1999; Capital asset management framework 2002).

Policy and Implementation Units

Successful implementation of PPPs requires the availability of diverse skills and expertise in procurement, legal, and financial management. These include, for example, knowledge of various PPP procurement methods; multistage contractor’s selection process; assessment and evaluation methods for multicriteria proposals, assessment of financial, legal, and tax issues; and negotiation strategies. Such expertise could be acquired through: (1) establishment of a PPP unit; and/or (2) improving the PPP skills of the departmental staff. The acquisition of such expertise is generally beneficial in improving project delivery for both traditional and PPPs systems, streamlining the implementation of PPPs within government, reducing bidding time, reducing transaction costs for both public and private partners, and standardizing bidding procedures.

The use of PPPs for infrastructure development would be efficiently introduced if a unit was created to streamline the implementation within a government. The unit could be established within a department, e.g., transportation or health care, serving the interest of that department. Alternatively, the unit could be central to all departments, which would be more efficient for:

1. Centralization of the PPPs experience, where the experience of different types of projects would help foster the procurement skills for other projects as well as future projects; and
2. Optimization of resources that would have to be spent by the different departments for acquiring the PPP knowledge.

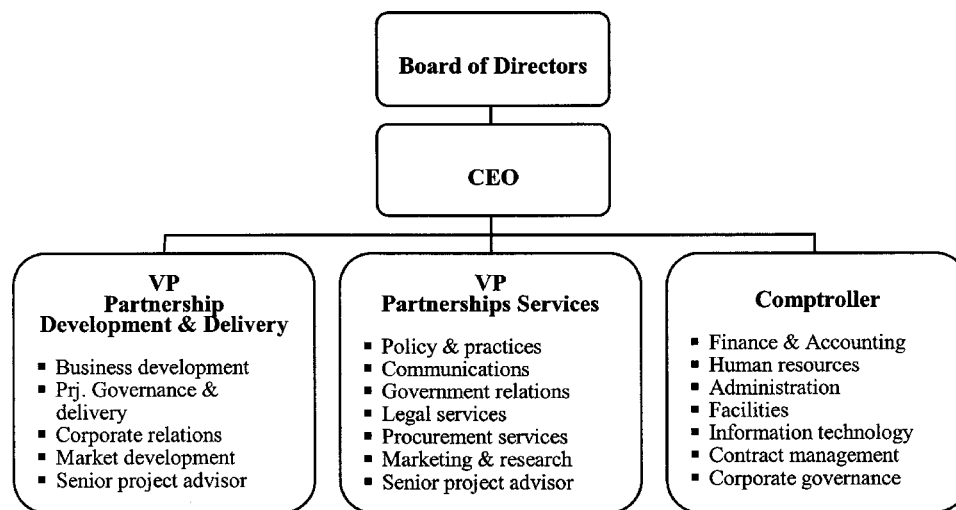


Fig. 1. Corporate structure of partnerships BC (adapted from PBC 2007)

A PPP unit would have to take a number of leading roles including: (1) policy development, e.g., through guidelines, approaches, and advice; (2) implementation and procurement management, e.g., assistance in the identification/assessment of PPP projects, selection of a PPP delivery system, development of project documents, selection of PPP contractors, and evaluation of proposals; and (3) PPP project approvals. For central PPP units that serve other government divisions or departments, the approval role and signing on agreements would lead to confrontation with the other government levels which ultimately would not be the best strategy for implementing PPPs. For example, in British Columbia, Partnerships BC (PBC; government agency) would act as the government procurement manager and/or financial advisor for all stages of procurement including financial close. However, signing concession agreements would be left to the government departments/agencies who are the direct owners of the projects.

PPP policy units may be established to focus primarily on PPP policy development while leaving the actual implementation to the concerned government departments or to a PPP implementation unit. Partnerships Victoria (Australia) (PV 2001a), HMT Private Finance Unit in the United Kingdom (HCL 2003), and the Scottish Private Finance Unit (CEPA 2005) are examples of policy units in their jurisdictions. Implementation of PPP units can be structured toward implementing partnerships; examples of these units include Partnerships UK (PUK) and Partnerships BC (PBC). In 2000, PUK started to support implementing PPP programs and projects. The personnel of PUK were mostly procurement specialists and would appoint external financial/legal advisors when needed. In 2001, PUK changed its structure to allow 51% of its shares to be owned by private companies with the ability of PUK to invest equity money in projects as well (HMT 2004a). PUK has taken a role in several health care, education, housing, defense, and transport projects.

In 2002, Partnerships BC (PBC) was created as a corporation wholly owned by BC and governed by a board of directors who report to a sole shareholder, the Province of British Columbia. The mandate of PBC is to promote, enable, and help implement PPPs (PBC 2005a, 2007). As shown in Fig. 1, the corporate structure of PBC has three functional areas: (1) partnership development and delivery, e.g., business development, project delivery, and corporate development; (2) partnerships services, e.g., policy

and practice, government relations, legal services, procurement services, and communications; and (3) finance and administration unit, e.g., finance and accounting, human resources, contract management, and corporate governance (PBC 2005b, 2007). PBC provides government clients (e.g., ministries, health authorities, education institutions, and local governments) with policy and procurement management services as well as full project management services. With its central position and an average of 35 staff, PBC managed the procurements of several types of projects including transportation, health, and water treatment facilities (see Table 4).

In order to remain viable however, a central PPPs unit would need to excel in its services and to expand its business. For example, PUK sustained its existence with its 51% private shares along with expanding the advisory services to other agencies worldwide. PBC is also required to expand its advisory business. PBC has a 6-year government service agreement and its mandate requires it to reach commercial viability within 4 years from establishment (PBC 2005b).

Improving the procurement skills and the expertise of the departmental staff is also useful in streamlining the implementation within government and in improving the delivery of projects. The United Kingdom took a further step by examining a system for accrediting public sector advisors (HMT 2003a). However, the development of a central PPP unit along with the improvement

Table 4. Examples of PPP Projects Managed by Partnerships BC

Project	Type	Cost (millions)	Concession (years)
Sea-to-Sky Highway	Transport	\$600	25
William R. Bennett Bridge	Transport	\$144.5	30
Kicking Horse Canyon Highway	Transport	\$130	25
Sierra Yoyo Desan Road	Transport	\$40	16
Abbotsford Regional Hospital and Cancer Centre	Health	\$355	30
Academic Ambulatory Care Centre	Health	\$95	30
Britannia Mine Water Treatment Plant	Water	\$27.5	20
Whistler Advanced Wastewater Treatment Plant	Water	\$26	10

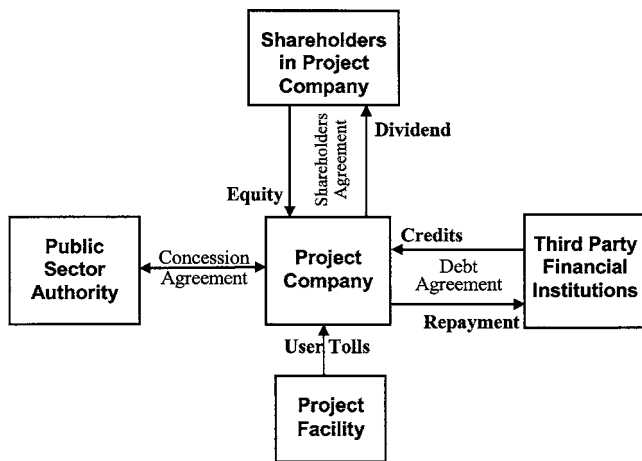


Fig. 2. Financial structure with private financing as driver

of the departmental staff skill would generally be required. For example, while PUK handles most of the PPP projects, the United Kingdom Department of Transport handles its PPP projects internally using the policies established by the government HMT Private Finance Unit. Similarly, in British Columbia, some PPP projects were not managed by PBC; for example the Richmond-Airport-Vancouver light rail was managed by the Greater Vancouver Rapid Transit authority (Translink 2003).

Perception of Private Finance Objectives

In a PPP finance-based approach, tapping private finance is a major objective to get the needed infrastructure built when insufficient government funds are available. For this objective, having robust demand is an important financial factor for a project to be successfully developed (Tiong et al. 1992; Tiong 1996). Projects are mainly funded through tolls and the feasibility of using user tolls as such need to be tested at the political and public levels. In some cases, however, collection of tolls was problematic. For example, in Washington State, Substitute House Bill 1006 was enacted in 1993 to allow PPPs (WSDOT 1994), however, it was amended in 1995 by SHB 1317 and followed by Substitute Senate Bill 6044 which dramatically affected the use of PPPs; one of the reasons was the objection to pay tolls. Nevertheless, the objective of tapping private finance was successful for the development of several projects worldwide. As shown in Fig. 2, the general financial structure of a project under such a scheme could have the private consortium setting and collecting the user tolls. BOT/BTO/concessions and franchises in the United States and worldwide are examples of this finance-based approach.

In the PPP service-based approach, the major emphasis is the optimization of the time and cost efficiencies in “service” delivery through the utilization of private sector skills, innovations, integration, and collaboration in project design, construction, financing, operation, marketing, and management. The services under this approach include, for example, the availability of unobstructed highway lanes, fixing facility defects within a prescribed response time from when they were first sighted (e.g., patching potholes and sealing cracks), management of traffic congestion, and alleviating road accident causes. The objective of using private finance under this approach was to achieve better performance in service delivery. Having private sector capital at risk is thought to drive completion of projects on time and on

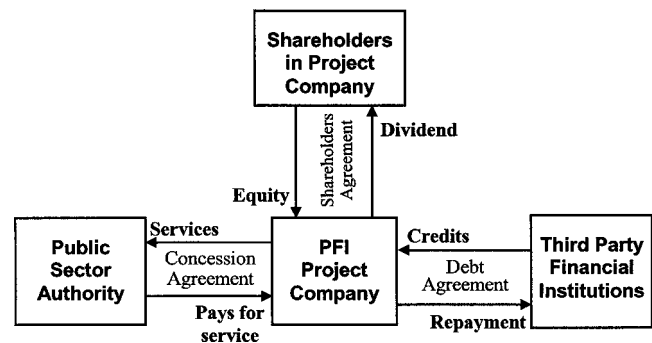


Fig. 3. DBFO regular financial structure (adapted from HMTF 2004)

budget and for improved service performance during the operation period. DBFO arrangements in the United Kingdom and British Columbia are examples of the service-based approach (HCL 2003; Capital asset management framework 2002). In essence, private finance under this scheme gives government relief from securing the upfront capital cost, in exchange for future government payments over the contract period. As shown in Fig. 3, the service-based scheme has the government compensating contractors from government funds (with or without user fees) over the contract/concession period where private finance is secured by these payments, not by the robustness of the demand (HMTF 2004). Further, at the extreme, government may participate in lending to the private sector, as illustrated in Fig. 4. The United Kingdom was piloting this lending mechanism, called Credit Guarantee Finance, in order to further reduce the cost of finance; contractors were still required to provide necessary insurance/guarantee for repayments (HMT 2003a; HMTF 2004).

There are cases, however, where both finance objectives (tapping private capital and better service delivery) are integrated to form an optimal use of PPPs. For example, the Sierra Yoyo Desan road in BC (BCMEM 2004a) employed a financial structure where PPPs were used to design, build, finance, operate, and maintain the road. The government collected direct-user tolls from the industrial road users (free for the general public) and then used the tolls to pay the contractor performance-based

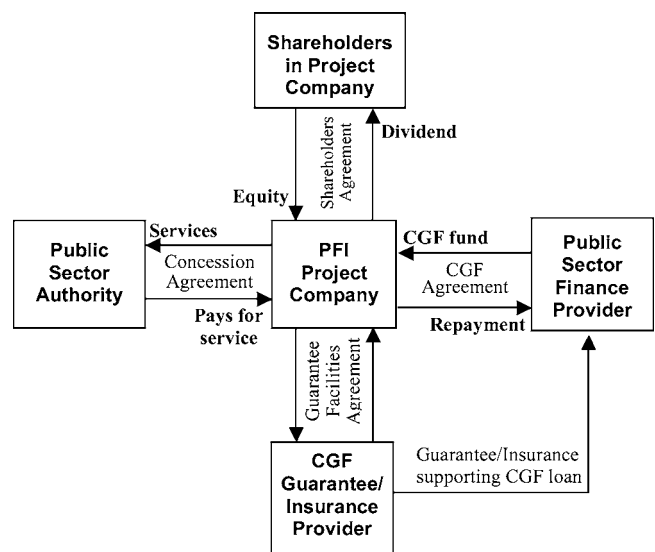


Fig. 4. Credit guarantee finance facility proposed for United Kingdom's PFI projects (adapted from HMTF 2004)

payments for the road services provided. The contractor financed the project and had no control on toll setting, collection, or distribution.

There are still other cases, however, where no private finance is used in the implementation of PPPs. An example is the DB arrangement which is neither finance based nor service based. Under this arrangement the facility itself is the subject of delivery of the PPPs; the private sector provides the design and construction services needed to build the facility while the government provides the services for which the facility was built. This is more like the traditional design-bid-build approach except with more integration between project design and construction. The extension of DB is the DBOM which resembles a service-based approach but without private finance. For these two arrangements, the objectives for which private finance was used under the service-based approach would then have to be achieved through other means such as substantial specifications and contract clauses that assure the performance of the operation and management (O&M) services.

Understanding the objectives in using private finance in PPPs, whether to tap private capital or for better service delivery, is therefore a key element for the proper implementation of a PPP. While governments may have valid reasons to adopt either of the finance or service-based approaches, the characteristics and implications of each should be well understood. Under the finance-based approach government may need to be flexible regarding the terms on which the private finance was obtained. A good example of flexibility was the case of Virginia's Dulles Greenway. The finance-based project had a 42.5 year concession period when it was first signed. Following financial troubles due to unexpected low demand, the private consortium had to restructure its debt. Although toll rates were reduced to attract more traffic, this was not sufficient to generate enough revenues and the government had to extend the concession by 20 years ("U.S. and Canada transportation project scorecard 2006").

Perception of Risk Allocation and Contractor's Compensation

A common objective in PPPs is the transfer of project risks to the party that is best able to control and manage the risk. The allocation should, however, be assessed in terms of its effect on the project and the ultimate users. The risks that the private sector are in a better position to control than the government include design risks, construction risks including cost overruns and completion time, and the future O&M cost overruns. On the other hand, governments should be able to retain, for example, a change-of-law risk. Demand risk is another significant risk, the allocation of which is subject to several considerations.

Under the finance-based PPP approach, one of the common risk management strategies is the allocation of demand risks to the private sector. Governments which use PPPs to attract private finance would not be in a position to bail the contractor out when the demand became insufficient to generate enough revenues to pay the lenders. Another justification is the intention to account the project as an off-balance sheet; accepting demand risk might be interpreted as endorsing public asset financing and the project would end up in the government books. Many of the earlier PPP projects in the United Kingdom, British Columbia, and the United States were developed with demand risk allocated to the contractor. A common example is the Channel Tunnel where both the United Kingdom and French governments allocated all project

risks to the developer (HMSO 1986). Other examples include Second Severn Crossing in United Kingdom (UKDOT 1986), Highway 104 Western Alignment, Nova Scotia (NSDOT 1995b), and SR 91 in California (CALTRANS 1993).

Projects with demand risk allocated to the contractor are generally paid for from project usage and user tolls. For these projects, agreements may provide for substitution clauses that give step-in rights to the lenders in case of default on payments. Further, the agreements usually require insurance and security packages to protect the government in case of developer's default. A consequence of such demand risk allocation is that a risk premium will be charged by lenders to cover the demand risk. This premium will show up in the cost of finance, resulting in higher project costs and ultimately in higher toll rates charged to the end users. Additionally, since tolls and project demand are the bases for revenue determination, protection through no-second facility, absolute-protection-zone, or noncompete clauses are important to guarantee project revenues. These clauses, however, could be problematic as they might hinder the government's maintenance, rehabilitation, and road upgrades around the project area. This proved to be the case in California's SR91 in which the government had to buy back the project (USDOT 2004).

Another approach for risk allocation can be distilled from British Columbia's and the United Kingdom's service-based PPP experience. The main government objective, in most cases, is the provision and continuity of the service whether the facility is used or not, and that risk allocation should be optimized in order not to affect the overall project cost or the overall value-for-money (HMTF 1999; HMT 2003a). Traffic demand risks in the United Kingdom's and British Columbia's PPP projects are mostly retained by the governments. Contractor's compensation is sourced from government funds and measured mostly based on the availability of the services and to a much lesser extent on usage (demand). Examples include British Columbia's Kicking Horse Canyon Road project (BCMOT 2004a), Okanagan Lake Bridge (BCMOT 2004b, 2005c), and Sea-to-Sky Highway (BCMOT 2004c). In these projects, the availability payment ranged between 70 and 90% of the project net present value (NPV), while traffic volume payments (shadow tolls) along with safety and other payments ranged between 10 and 30% (Abdel Aziz 2007a). Note that where project conditions allow, direct government-controlled user tolls may also be used with other government funding sources. Examples include British Columbia's Richmond-Airport-Vancouver rapid transit project (Translink 2003) and the Sierra Yoyo Desan road (BCMOT 2004a,b).

Unlike user-toll payments in the finance-based approach, a major characteristic of the payment mechanisms in the United Kingdom's and British Columbia's PPP experience is that payments are mainly based on performance specifications and are linked to the achievement of government objectives in the project (Abdel Aziz 2007a). Performance specifications for all project assets are established and linked to the payments (availability, operation and maintenance, safety, user satisfaction). Payments are then subject to availability and performance deductions, e.g., deductions if a highway lane is not available, potholes not patched, pavement cracks not sealed, ice not removed within a specific response time, and accident rate not improved. With substandard performance, a contractor might experience zero compensation before a default clause is invoked.

The optimization of risk allocation in British Columbia's and the United Kingdom's service-based approach may provide, however, for partial demand risk to be allocated to the private

sector in order to achieve better value for money. For example, in British Columbia's Britannia Mine water treatment plant, performance operating payments to the concessionaire are linked directly to the volume of water treated for metal pollution (BCMSRM 2004). PPP housing and office building projects at the local government level may allocate the usage risk to the private sector if the government no longer needs full usage of the facility (HMT 2003a). Also, where the objective is to maximize project capacity, partial traffic risk would be allocated to the private sector. An example is British Columbia's Okanagan Lake Bridge where the incremental traffic over the existing traffic determines the traffic-volume-payment; a payment which accounted for 25–30% of the project NPV (BCMOT 2004b).

With demand risk retained by government under the service-based approach, the risk premium in the cost of finance should be minimized and subsequently the overall project cost minimized. This should eventually give better value for money than the finance-based approach which allocates all risks to the contractor. Understanding the objective of risk allocation and the implication of the allocation choice is a key variable for a successful PPP implementation.

Perception of Value-for-Money

For public accountability, governments usually try to establish the best financial structure and contractual terms in a PPP agreement. How to do that varies between PPP approaches. Under the finance-based approach, governments try to optimize and obtain the best value for each dollar spent in a toll rate. This is achieved by establishing a cap on revenues, enforcing specific toll rate setting mechanisms, requiring specific equity-debt ratio, limiting the concession period to the time all debts are retired, and/or capping the contractor's rates of return. Examples include the SR 91 where a 17% rate of return was established for the developer (CALTRANS 1993) and Highway 104 where the concession period was to end once all debts were retired (NSDOT 1995b). Under this approach the value of each dollar in user tolls is expected to reflect all project conditions, risks including demand, and the higher private finance costs.

In the United Kingdom and British Columbia's service-based approach, governments seek to achieve the best value for taxpayers' money as well as user tolls, if any. This is achieved by being impartial when selecting a procurement method (traditional or PPP) that would achieve the best value for money, being reasonable in risk allocation where government may retain the demand risk, using private finance as an incentive for better performance, and compensating contractors based on their performance and the services provided. Value-for-money analysis is performed by comparing the project under both PPP procurement and under public sector traditional delivery, referred to as public sector comparator (PSC). Both quantitative and qualitative analyses are used which rely on the whole life cycle cost analysis (HMT 2003b, 2004d; PV 2003a). Under this approach the value of each dollar in taxpayers' money or user tolls reflects all project conditions and only the risks carried by the private sector, i.e., without demand risk and the higher cost of finance.

In British Columbia and the United Kingdom, the value-for-money approach is used regardless of the accounting treatment of the project—whether it will be on- or off-balance sheet (HMT 2003a; HMTF 1999). As of April 2003, the United Kingdom's PFI program (initiated in 1992) had 570 deals signed with total investment of £36 billion which included £20.5 billion (60%) in

Table 5. Summary for Value-for-Money for United Kingdom PFI Transportation Projects

Project	PSC ^a (£m)	Winning DBFO bid (£m)	Value for money (£m)	Savings (%)
M1-A1	344	232	112	32.6
A1(M)	204	154	50	24.5
A419/A417	123	112	11	8.9
A69	57	62	(–5)	–8.7
M40	276	182	94	34.1
A19	177	136	41	23.3
A50/A564	77	67	10	13.0
A30/A35	149	148	1	0.7
A1DD	245	203	42	17.14
A249	98	100	(–2)	–2.04

^aPSC=public sector comparator.

36 transportation projects, £3 billion in 126 health-care facilities, and £2 billion in 93 educational facilities. Around 60% of the investment was recorded on the balance sheet of the government (HCL 2003; HMT 2003a).

Table 5 shows the value for money and savings obtained by United Kingdom from implementing PFI transportation projects. The savings as reported by the United Kingdom National Audit Office had an average of 15% (NAO 1998; HMT 2003a). Similarly, in British Columbia the value-for-money reports issued after financial completion of PPP projects explained the savings of using PPP over the traditional delivery, for example, the Okanagan Lake bridge had a NPV of \$170 million which is compared favorably to the \$195 million had the project been developed using a public sector comparator.

In some projects, and for a given scope of work, the NPV of a PPP project would be higher than that of the PSC; leading to a PPP being a none-preferred delivery method. However, the final decision should also consider the extra benefits that may be obtained if the PPP contractor provides more output than required by the contract scope. As can be distinguished in Table 5 two PPP projects had NPV higher than the PSCs, but were still perceived as good PPP projects. Similarly, in British Columbia, the Sea-to-Sky Highway experienced a NPV of \$789.8 million over the 25-year contract which was higher than the \$744.0 million NPV obtained using PSC. The value for money was achieved through the additional improvements beyond the base line scope. Some of the improvements included, for example, additional 20 km passing lanes, 16 km median barrier, 30 km shoulder and center-line rumble strips, 10 km wider shoulders for improved safety, highly reflective pavement markings, improved lighting and roadside reflectors, and improved highway maintenance response to weather conditions (BCMOT 2005b). The user benefits of the additional improvements were estimated at \$130 million over the benefits of the baseline scope.

The two finance and service based approaches try to achieve the best value for money for the toll rate dollars or the taxpayer's money. Both approaches have private finance. However, under the service-based approach the risk to the private consortium and the lenders becomes the "controllable" contractor's performance rather than the "uncontrollable" demand fluctuations. This would eventually provide for better value for the taxpayer's money (or facility users) more than could be obtained under the finance-based approach. Project Finance (2006) mentioned that basing the risk assessment on availability and operational performance rather

than on traffic volume would naturally result in a lower risk premium for the private debt.

Transparency and Disclosure

For public accountability, public agencies need to maintain fair, open, and transparent processes for the procurement of public projects. These accountability characteristics are generally maintained in the traditional delivery system through its separate-packages/contracts in design; construction, and operation; lowest-responsible bids; and the open tender processes. In contrast, a PPP delivery system generally has the following characteristics:

1. Multistage process for contractor's selection, e.g., stages for expressions of interest, contractors' qualifications, proposals, and best offer and negotiation;
2. Multicriteria evaluation process for contractor's submissions for each stage, including price and nonprice parameters;
3. A development/concession agreement that generally cover all project phases of design, construction, and operation; and
4. Risk allocation strategies that transfer most of the project risks, that were traditionally carried by the public sector, to the private sector partner in the PPP.

The above PPP characteristics may lead to some doubts about the fairness and transparency throughout the procurement process. Consequently, governments may take several steps to maintain the accountability requirements. For example, PBC has maintained a disclosure practice that aims at disclosing as much information as possible without jeopardizing the competitive process, maintaining the government negotiating position and its ability to generate the best value for taxpayers' money, and protecting the private sector's sensitive information. The disclosure practice includes the following (PBC 2005c):

1. Tender documents: recommends full disclosure of tender documents that include requests for expressions of interest (RFEI), RFQ, and RFP;
2. Responses to tender documents: recommends disclosing the number of respondents for RFEI, RFQ, and RFP; recommends disclosing names of those short-listed for RFP; conditional disclosure or project-by-project basis for respondents' names for RFEI and RFQ; does not recommend disclosing submission, e.g., proposals; and
3. Concession agreements: does not recommend disclosure of draft concession agreement; recommends disclosing final agreement after removing personal, proprietary, or commercially confidential information.

Additionally, PBC employs two important disclosure practices. The first is the use of fairness auditors who would disclose their opinions about the procurement process during the selection of contractors and evaluation of proposals. For example, the RFP for the Sea-to-Sky Highway project explained that PBC engaged an independent advisor, fairness advisor, to provide an objective opinion as to the fairness of the consultation and selection process, including monitoring the evaluation of the proposals (BCMOT 2004c). During the selection stages, the fairness advisor produced five reports that were made public after each stage explaining the fairness of the selection and evaluation of submission (PBC 2005d).

The second measure for PBC disclosure practice is the development of a project value-for-money report that shows the rationale, objectives, and processes that led to the use of a PPP for the project and how the value for money is measured.

The United Kingdom's experience has similar public account-

ability practices for PPPs. Value-for-money appraisal reports for PFI projects are published by the United Kingdom National Audit Office (NAO 1999). Along with the use of value-for-money assessments, at the PFI program level the government is committed to disclose in the financial statements and budget reports all records of transactions, projects performance, and future payments for PFI projects (HMT 2003a). Furthermore, the government introduced the Gateway process as a performance management tool to track and assess the effectiveness of projects during the procurement process. A similar development, called the Project Review Group, was established at the local authority level.

Standardization of Procedures and Contracts

Successful implementation of a PPP also requires improving the performance of the PPP procurement processes, e.g., selection stages, timelines/schedule, and contracts. Improving these processes is important since transaction time and costs of PPP projects are generally higher in PPP projects than in the traditional delivery systems (HCL 2003).

In British Columbia, performance improvement of the procurement process was manifested through a number of factors. First, the procurement process for the projects follows the same procedures and stages established in the Capital Asset Management Framework (CAMF) which follow a three-stage process of solicitation, evaluation/negotiation, and contract award. Solicitation generally includes the issuance of a RFQ and a RFP in a one or two step process. When there are doubts about the market capacity, an initial step referred to as registration of interest or the issuance of request of expressions of interest is used (Capital asset management framework 2002). The framework further prescribed how unsolicited proposals would be evaluated to check whether other proponents could achieve a better proposal; a process that is similar to the *Swiss Challenge* process that puts the project in the market for a window of 30/45 days for other bidders to come up with a challenging proposal and then gives right of first refusal to the original bidder (WB 1998; Hodges and Dellacha 2007). A second factor for successful implementation of PPP reflects the schedule/timelines of the procurement stages. Table 6 shows that the timelines of the RFQ and RFP for several PPP projects were met within a reasonable time frame during the procurement stages. The ability to meet timelines gives the private sector confidence in the PPP programs and assists in the determination of the time and cost requirements.

In the United Kingdom, the government has gone one step further through the development of guidance for standardized PFI contract. The objective of the standard PFI contract was to reduce the length of time and costs of negotiation, allow consistency of approach and pricing of projects, and promote common understanding of risks in standard PFI projects (HMT 2004c).

Performance Specifications

In a traditional PPP, contractors carry out the design, construction, financing, and O&M obligations detailed in the agreements. Contractors, while carrying out these obligations, are required to comply with the various standards used by the agency. In most cases, these standards are method specifications that describe the inputs, e.g., materials and methods for the contractor to follow.

Unlike the traditional arrangements however, performance-

Table 6. Comparison of Schedules for Procurement Process for Some PPP Projects in British Columbia

Projects	Schedule in registration of interest/RFEI	Schedule in the final value-for-money report
SYD Road		
ROI ^a	June 27, 2003	June 27, 2003
RFQ	Mid-July 2003	July 18, 2003
RFP	Mid-Sep 2003	Sep 29, 2003
Sea-to-Sky Highway		
ROI ^a	Jan 15, 2004	Jan 15, 2004
RFQ	Feb 2004	March 3, 2004
RFP	June 2004	Aug 31, 2004
Kicking Horse Hwy.		
ROI ^a	May 2004	May 2004
RFQ	July 2004	July 2004
RFP	Fall 2004	Oct 2004
Okanagan Lake Br.		
RFEI	Oct 2003	Oct 28, 2003
RFQ	Dec 2003	Dec 30, 2003
RFP	Spring 2004	May 31, 2004
Britannia Water Plant		
RFEI	Jan 2004	Jan 2004
RFP	April 2004	May 2004

^aROI=registration of interest.

based (PB) contracts are becoming common in the United Kingdom and British Columbia's PPP service-based approach. Under performance-based contracts, governments focus on the results, output, or outcome of the end product (project or facility) not on the materials and methods used in building or maintaining the product. Performance specifications are established for each element of the asset and then clearly defined as to the minimum acceptable performance level and response time to fix deficiencies. The use of PB specifications has been extended beyond transportation projects to include health care facilities such as the Abbotsford Hospital (BCMHS 2005), water treatment plants such as the Britannia Mine Water treatment project (BCMSRM 2004), and other types of facilities. This has become common on the service-based PPP approach where the contractor is paid for the services provided.

Guidelines for PPP Program Implementation

The above discussion explained a number of principles for characterizing the implementation of PPPs. In light of these principles, a number of guidelines are suggested below for the successful implementation of PPPs; these guidelines are categorized under two headings: legal framework and institutional integration. To illustrate these guidelines, they are discussed in light of the United States PPP experience.

Legal Framework

A PPP legal framework needs to be established within the government to institutionalize the implementation of a PPP into a structured program. Guidelines in this context include:

- 1 A legal framework, initiative or act, should be established to authorize the use of the alternative delivery systems without being limited to time frame, specific projects, geographic lo-

cation, or transportation mode.

Institutionalization of the use of PPP projects requires the availability of enabling act that could be used whenever a project is qualified for development as a PPP. This is particularly needed for the implementation of PPPs in the United States. Statistics of the FHWA show that out of 52 United States and territories, only 22 states (including one territory) have PPP enabling acts (FHWA 2006). One state, New Jersey, let its authority to use PPP expire in 2002 (USDOT 2004). Some acts were enabled only for pilot and demonstration projects, e.g., the early PPP acts of California (AB 680) and Washington State (SHB 1006) and the PPP acts of Alaska, Arizona, Indiana, Missouri, and North Carolina. For example, the Indiana PPP act of 2006 was enabled to authorize only the Indiana Toll Road and the development of the I-69 highway. Additionally, some of the states acts (five out of 22) put restrictions on the geographic location of the PPP project (e.g., California AB 1467 of 2006) while other states (11 out of 22) had restrictions on the type of transportation mode eligible for PPP delivery (FHWA 2006).

2. A broad procurement/PPP act should provide for the choice of the delivery system (traditional or PPP) that provides the best value for taxpayers' money (or user toll dollars) without prior bias toward a specific system.

A delivery system should be selected based on achieving the best value for the money. The 35-year SR 125 in California is a BTO project where the private consortium arranged a portion of the financing and was allowed to set market toll rates based on an 18.5% cap on the return on investment. The BTO is the arrangement implied by the California AB 680 act of 1998 and the AB 1467 of 2006 where the private consortium is authorized to impose tolls and use the revenues to pay all capital and O&M costs. In this typical finance-based structure, each user-toll dollar reflects the risks carried by the consortium (e.g., demand risk). The acts have no other PPP arrangements and payment mechanisms. However, an alternative route of delivery could have been, for example, to compensate the consortium not through the number of vehicles using the road, but through the availability of the facility (highway lanes), the performance and reliability for the facility, and the management of the consortium in dealing with the safety and congestion of the facility. This alternative, which still uses user toll funding and private financing, is one of the service-based PPP approaches which could be evaluated along with other PPP arrangements and traditional approaches in order to determine which system would provide the best value for the user toll dollars. A PPP act should be broad enough to allow for evaluating all feasible delivery systems.

3. A broad PPP act should provide for evaluating any financing mechanism that would aid in achieving the best value for taxpayers' money (or user toll dollars).

In California, financing for the SR 125 was provided through private equity, commercial debt, and TIFIA loan. The TIFIA loan assisted in raising the necessary financing for the project. TIFIA is the federal credit assistance established under TEA-21 of 1998 and continued under SAFETEA-LU of 2005. However, statistics of FHWA show that only 11 of the 22 PPP-enabled states allowed the use of TIFIA in financing PPP projects. Toll revenue bonds/notes is another financing instrument for PPP projects, however, nine out of the PPP-enabled states have no authority to use such financing. Furthermore, only five of the PPP states have the author-

ity to form nonprofit organizations and to use them to issue debt (FHWA 2006). Yet, still other states may not allow the use of private finance; for example the 2005 HB 1541 of Washington State allows only state treasurer-issued indebtedness. Evaluating the different financing sources to achieve the best value for money should help in the successful implementation of PPPs.

4. A procurement act should enable the different government levels the authority to use PPPs. Streamlining the implementation of PPPs and the formation of a structured program requires PPPs to be used by any government level that would find benefits in the alternative system. However, 16 out of 22 PPP-enabled states were restricting PPPs to state DOTs and turnpike authorities (FHWA 2006). Some states have managed to revise their laws, e.g., Virginia 2005 PPTA, to allow any "responsible public entity" to use PPPs.
5. A procurement act should be broad enough in its language to give the authority (e.g., to PPP unit) to evaluate and judge the controversial issues such as quantification and cost allocation of changes in future scope/service, noncompete clause, length of concessions, and the allocation of specific risks (e.g., cost of extra demand, and subsurface conditions). These would be part of the guidelines to be detailed by the PPP unit in guidance reports. The act, however, needs to be clear in explaining the noncontroversial issues such as the types of project ownership permitted during the term of the agreement.

A noncompete clause in the agreement for the DBFO Okanagan Lake Bridge, British Columbia, provided for adjustment of the traffic bands and shadow tolls if the government initiated capital works events that would affect the revenues and the possibility of the private consortium to pay back the debt. The adjustment would provide for the NPV before and after the event to be equal (BCMOT 2005a). With this strategy, the noncompete clause was justified. There was no repealing of a PPP act and no buying back of the project as was the case in California SR91, and no prohibition of the noncompete clause as in Alabama and North Carolina. The authority needs to be given to investigate strategies to deal with such controversial issues without a need to amend any PPP law.

Project timelines, e.g., concession length, should be left to a PPP unit to determine based on project conditions, whole life cycle cost, likely term of senior debt, and financial analyses. The PPP unit may, for example, determine that the concession is to end once the private debt is retired. A limit on the length of concessions, e.g., the 35 years in California's AB 680 or the 50 years in Texas HB 2702, unless established for specific reasons, might unnecessarily affect achieving the best value for money. Flexibility in project time lines is important, particularly under the finance-based PPP approach. An example is the extension of the concession period for Virginia's Dulles Greenway, as mentioned earlier.

6. Guidelines should be developed with sufficient detail to assist the different government levels in achieving the intent of the PPP acts:
 - a. Guidelines for the design of payment mechanisms that link the private consortium's compensation to the achievement of specific government objectives in the project. Massachusetts Route 3 North (MR3N) is a highway project for which the government created a not-for-profit corporation to issue tax-exempt bonds based on lease payments pledged by the DOT. Bond

proceeds were used to compensate for the design-build part, while the future lease payments would service the debt and the O&M cost. The use of DBOM with the 30-year concession and the substantial contract clauses was envisioned to provide incentive for quality assurance and to identify an efficient and cost effective maintenance program. MR3N is an example of a DBOM arrangement which along with DB are the preferred PPP arrangements in the United States ("U.S. and Canada transportation scorecard 2006"). However, since owners under DBOM have less control on the project than in traditional systems, owners would have to carefully define all the standards for the project, include enough contract provisions along with incentives and penalties to care for performance, and carefully monitor the contract compliance (NGKE 2004; Dahl et al. 2005). The above was a common structure of the DBOM arrangement. However, when implementing PPPs, agencies may need to evaluate other structures or payment mechanisms to choose the one that best achieves government objectives. For example, since future performance in O&M is of concern, then the agency may need to use performance specifications for all road assets; define performance measures (e.g., response time to patch potholes, snow removal, etc.); and define performance payments where the consortium's compensation would be directly linked to the achievement of the specified performance. Furthermore, part or all of the design-build capital cost would be provided under the performance payment. The agency may also add other payments such as a safety payment where the sum of all payments would have to be under the government annual affordability limit (e.g. the MR3N lease payment or available user tolls) (Abdel Aziz 2007a,b). Texas has started using these alternative payment mechanisms—the RFQ of the North Tarrant Express toll road mentioned that compensation would be a mix of milestone, availability, and performance, among other payment types (TXDOT 2006).

- b. Guidelines for the methods used in the value-for-money analysis, include, for example, development of public sector comparators, quantification of risks, life cycle cost analysis, revenue modeling, financial analysis, determination of the length of concessions, and determination of the discount rates.
- c. Other important guidelines need to be detailed including guidelines for the selection of contractors; evaluation of proposals, transparency, and disclosure; and standardized agreements.

Institutional Integration

Streamlining and integrating the use of PPPs at the different government levels is an important criterion for the successful implementation of a PPP:

1. A PPP-knowledgeable staff or special PPP units need to be available to be responsible for policy development, dissemination of PPP knowledge, and implementation of PPPs.

A survey of the websites of the 22 PPP-enabled United States shows that most of the implementation of PPPs is managed internally by the government staff, e.g., DOTs, turnpike authorities, or local authorities. This is done to the extent that the PPP law allows the use of PPPs by entities

other than the DOTs. The implementation generally follows the requirements of the state PPP laws. Where the law does not provide details, guidance is provided by the state DOTs. For example, in Texas, the state turnpike authority and the regional mobility authorities follow the Texas PPP law, however, they follow the DOT rules for the evaluation of proposals and the criteria established in the selection documents (e.g., RFQ and RFP) as those are not detailed in the law. Similarly, the central office of Florida DOT and the turnpike toll authority provide guidance to the implementation of PPPs (FDOT 2005). In two states, however, PPP policy development and implementation are centralized in a separate office within the DOT. For example, the Innovative Project Delivery Division of Virginia DOT is responsible for developing and implementing a statewide design-build and PPP program in Virginia. The division developed the guidelines for the amended Public Private Transportation Act (PPTA) of 2005 so that consistent application of PPPs would be used by the transportation agencies and the other public entities (VDOT 2005). Similarly, the Innovative Partnerships Program in Oregon is a separate division within the DOT. The program, created by the Oregon PPP law (SB 772 of 2003), includes an assortment of expert consultants contracted to assist in project procurement, evaluation of proposals, negotiation, and management of PPP projects (ODOT 2007). After a series of PPP workshops held by the FHWA, the lack of familiarity with the concept of PPPs within many state transportation agencies became evident (FHWA 2005b). To compound the issue, only ten of these 22 PPP-enabled states have no authority to hire external consultants for PPPs (FHWA 2006). The potential for a successful implementation of a PPP requires the existence of a unit, division, or program (as in Virginia or Oregon) to centralize the policy development and dissemination of PPPs within government. The cases of Partnerships BC, Partnerships UK, and Partnerships Victoria further illustrate the potential of PPP units.

2. Employee protection plans must be developed to address the concerns of implementation. Improving the value for money for the taxpayers, or to the public at large, might be problematic for one sector of the general public. The implementation of PPPs might pose a job threat to the existing employees, e.g., design, construction, and maintenance staff. Consequently, internal opposition would hinder the implementation of PPPs within governments. For example, in California, the Professional Employees in California Government (PECG) actively opposed PPPs (FHWA 2005b). Since the repeal of the California AB680, the efforts to enact another bill were hindered through the opposition of the engineers' union (Reason 2006). Finally, in May 2006, AB 1467 was enacted to allow the use of PPPs for four projects until 2012. As such, fears and concerns of the staff must be addressed for a successful implementation of a PPP. In the United Kingdom, after the PFI, the problem was openly discussed and a number of measures were taken to ensure the protection of employees. For example, the employees who had to transfer from the public to the private sector were offered protection for the transfer terms and conditions as well as pension protection, among other strategies (HMT 2003a).

Conclusions

The study and analysis of the service-based PPP approaches in the United Kingdom and British Columbia, and the comparison of

these approaches to a finance-based approach, highlighted a number of principles that would characterize the implementation of PPPs at the program level. The principles included: (1) the importance of understanding the objectives of using private finance when selecting a PPP arrangement; (2) the implication of allocating project risks to the private sector; (3) the necessity of a broad and comprehensive PPP legal framework; (4) the need to assess the value for money when selecting a delivery system; (5) the importance of creating a PPP unit for policy development and/or implementation; (6) the necessity of maintaining the transparency in the selection process; (7) the importance of standardizing the procedures and contracts; and (8) the importance of using performance specifications. A PPP program could be characterized as successful based on the degree of achievement and understanding of these principles.

In light of the identified principles, guidelines for successful implementation of PPPs were suggested. The analysis of the guidelines within the context of the United States suggests that successful implementation could be attained at the program level through: (1) enacting broad enabling legislation that is not limited to pilot/demonstration projects or to a specific government level; (2) selecting the delivery system (traditional or PPP) that would provide the greatest benefits to the public or users; (3) allowing the use and selection of the financing approach that would achieve the best value and benefits to the public; (4) completing comprehensive analysis and articulating clearly the controversial issues such as the noncompete clauses; (5) evaluating the various payment mechanisms and selecting the one that best achieves the government objectives; (6) creating PPP units particularly for policy development; and (7) protecting the employees who would be affected from the implementation of PPPs. It is suggested that government agencies looking at PPP implementation consider these principles and guidelines as strong criteria for a successful implementation of PPPs.

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