

# Paving the Way for Public–Private Partnerships in Infrastructure Development

Xueqing Zhang, M.ASCE<sup>1</sup>

**Abstract:** Infrastructure privatization has multidimensional impacts with long-term uncertainties and wide risk portfolios. A wide range of barriers to public–private partnerships (PPPs) in infrastructure development have been identified through a questionnaire survey, which are broadly classified into six aspects: (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. To explore measures for removing these barriers, a systematic research approach (literature review, case studies and interviews/correspondences with experts and experienced practitioners) has been taken to draw experience, learn lessons, and benchmark the best practices in international PPPs. An improved PPP protocol for infrastructure projects in general has been developed, addressing key issues in nine areas: (1) appropriate roles of governmental authorities; (2) best value for money approach; (3) effective management of adviser services; (4) formulation of appropriate PPP schemes; (5) use of relational contracts; (6) improvement of the procurement framework; (7) payment structure; (8) contract monitoring, termination, and step-in rights; and (9) transfer management. Effective measures for successful PPPs are identified in each of the nine areas.

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## Introduction

Many types of public–private partnerships (PPPs) have been practiced in international infrastructure development. There is also a great international infrastructure market well positioned for private sector participation. This includes the private finance initiative (PFI) program in the United Kingdom, PPP transportation projects under the Intermodal Surface Transportation Efficiency Act in the United States and build–operate–transfer (BOT) type projects in many developing countries such as China and the Philippines.

The PPPs switch away from asset-based projects to service-orientated activities by transforming public sector clients from being owners and operators of infrastructure projects into purchasers of long-term services from the private sector that is responsible for designing, building, financing, and operating the assets. Public clients pay only on delivery of services that meet specified quality standards (*Partnership for prosperity* 1997).

A broad range of infrastructure projects have been successfully developed through PPPs with significantly increased value. For example, the first eight design–build–finance–operate (DBFO) roads in the United Kingdom achieved an average public cost saving of 15% (*DBFO-value in roads* 1997). However, infrastruc-

ture privatization involves social, political, economic, legal, and environmental dimensions with long-term uncertainties and wide risk portfolios. Various problems have been encountered in international PPPs due to the short history and lack of PPP experience and expertise in many countries, for example, the failure of two BOT transportation projects in Thailand (Ogunlana 1997) and the privatized national sewerage project in Malaysia (Abdul-Aziz 2001).

The worldwide practices and problems encountered make it all the more important to identify potential barriers to PPPs and explore effective measures to remove these barriers and pave the way for PPPs. This would undoubtedly facilitate the establishment of general laws, regulations, guidelines, and procurement frameworks for effective and efficient infrastructure development. For this purpose, the author has conducted a questionnaire survey, from which a wide variety of barriers to infrastructure PPPs have been identified. To explore measures for removing these barriers, a systematic research approach (literature review, case studies and interview/correspondences with experts, and experienced practitioners) has been taken to draw experience and learn lessons from international PPP practices. Effective measures for removing these barriers and improving the PPP protocol have been identified and generalized by analyzing, comparing, and benchmarking the evolving body of worldwide PPP knowledge.

## Identification of Barriers to Infrastructure Public–Private Partnerships

### Background of the Questionnaire Survey

The questionnaire survey [which was entitled “Procurement of Build–Operate–Transfer (BOT) type projects”] was conducted from December 2000 to May 2001, aiming to solicit and consolidate worldwide expert knowledge and expertise in a number of

<sup>1</sup>Professional Engineer, Yellow River Conservancy Commission, The Ministry of Water Resources of China, 11 Jinshui Rd., Zhengzhou 450003, China.

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**Table 1.** Country Wise Respondent Breakup Details

Country	Number of respondents
Australia	1
Hong Kong, China	14
India	1
Japan	1
Peru	2
The Philippines	3
Mainland China	1
Malaysia	2
Singapore	1
South Africa	1
Thailand	2
United Kingdom	13
United States	4
Total	46

critical issues in international infrastructure PPPs that would contribute to the formation of workable and efficient PPP protocols. This was a long survey including five parts: I. Background of survey respondent; II. Critical success factors for BOT-type projects; III. Value for money to the client; IV. Concessionaire selection; and V. Barriers to BOT-type procurements.

Forty six respondents have returned complete questionnaires. They are from 42 different organizations in a number of countries including Australia, Hong Kong Special Administrative Region of China (hereinafter referred to as Hong Kong), India, Japan, Peru, the Philippines, Mainland China, Malaysia, Singapore, South Africa, Thailand, United Kingdom, and United States. Table 1 shows the country wise respondent breakup details. In addition, a number of respondents have provided constructive comments on PPPs although they have not returned completed questionnaires. All these respondents have been involved in PPP projects or have done significant research in this field. Many of the respondents are from organizations that have rich PPP experience, knowledge and expertise, for example, Essex County Council (United Kingdom), Department for International Development (United Kingdom), Partnerships United Kingdom, Manchester City Council (United Kingdom), Public/Private Partnership Unit of the Ministry of Defense (United Kingdom), Schools Private Finance Team of the Department for Education and Employment (United Kingdom), Gammon Construction Ltd. (Hong Kong), Nishimatsu Construction Co. Ltd., Hong Kong Branch, Southern Energy Asia-Pacific Ltd. (Hong Kong), Hong Kong Highways Department, Hong Kong Transportation Department, the Philippine BOT Center, International Finance Corporation, the Asian Development Bank, and the World Bank.

### Identified Barriers to Public-Private Partnerships

In Part V of the questionnaire survey, the following requirement is made: "Please identify (in your opinion) a few critical barriers that may have retarded the extended use of BOT in infrastructure procurement." Each respondent listed some critical barriers. Totally, they indicated dozens of barriers to PPPs. These barriers are analyzed, consolidated, slightly reworded, and broadly classified into six categories: (1) social, political, and legal risks; (2) unfavorable economic and commercial conditions; (3) inefficient public procurement framework; (4) lack of mature financial engineer-

ing techniques; (5) problems related to the public sector; and (6) problems related to the private sector. Please see Table 2 for details.

### Exploration of Barrier-Removing Measures

A systematic research approach has been adopted to explore PPP knowledge that is dispersed worldwide and rarely compared. This approach involves three phases: (1) literature review, (2) case studies, and (3) interviewing and correspondence with experts and experienced practitioners. Measures for effective removal of these barriers have been derived by analyzing, extracting, codifying, benchmarking, and generalizing this evolving body of international PPP knowledge.

#### Literature Review

An extensive literature survey of relevant published and documented information has been carried out. Most of the reviewed literature is in printed hardcopy format. Various articles and useful knowledge in several online databases and World Wide Web pages have also been explored. This literature review is from the perspective of PPPs and focused on key issues in this domain. These include feasibility study, risk allocation, source selection methodology, prequalification and tender evaluation methods, and criteria, critical project success factors, contract management, financial arrangements, relevant laws, regulations and guidelines, good practices and innovative procurement approaches, and relevant decision-making frameworks.

#### Case Studies

These include PFI projects in the United Kingdom, BOT-type toll roads in the United States, BOT tunnel projects in Hong Kong, BOT-type projects in Australia, BOT power and transportation projects in many developing countries such as China, India, the Laos PDR, The Philippines, Sri Lanka, and Thailand. These PPP projects include roads, bridges, ports, airports, and railways in the transportation sector; power, telecommunication, water supply, and waste disposal systems in the utilities sector; and schools, hotels, hospitals, prisons, and military facilities.

#### Interview and Correspondences with Experts and Experienced Practitioners

Face-to-face and telephone interviews with experts and experienced practitioners have been conducted. To ensure fruitful interviews, lists of questions and discussion issues stressing different aspects of PPPs according to the types of interviewees are sent ahead of the targeted dates of interview such that they have time to prepare and collect relevant information. In addition, postal, fax, and e-mail correspondences with a number of public clients, consultants, concessionaires, contractors, financiers, lawyers, and academic experts in a number of countries yield a wealth of experiential information and expert opinions.

#### Measures for Effective Removal of Identified Public-Private Partnership Barriers

An improved PPP protocol as shown in Fig. 1, dealing with nine key aspects and each of them incorporating a number of barrier-

**Table 2.** Barriers to Public–Private Partnerships (PPPs) in Infrastructure Development

Main category	Barrier items
Social, political, and legal risks	(1) Unstable political situation; (2) instability of governments; (3) lack of or poor legal/regulatory framework and unenforceable of contracts; (4) public oppositions; (5) change in law; (6) politics does not understand risk allocation; and (7) too many government restrictions.
Unfavorable economic and commercial conditions	(1) Weak economic strength and poor prospects for economic growth of the local economy; (2) economic risks and uncertain economic climate in developing countries; (3) project fundamentals cannot justify investments; (4) lack of a strong capital market; and (5) uncertainties in the demand and supply during the long contract period.
Inefficient public procurement framework	(1) Public clients initiate PPP projects but do not incorporate them in their development plans. This has negative impacts on the revenues of the projects; (2) lack of appropriate standard project procurement framework; (3) corruption resulted from unsolicited PPP schemes; (4) poor project definition and articulation of client's requirements at the tender stage; (5) lack of basic and reliable data for tender preparation; (6) inadequate means of controlling and allocating tender costs; (7) lack of transparency in contract awards; (8) lack of proper procedures for contract negotiations; (9) long procurement processes and endless negotiations; and (10) high transaction costs.
Lack of mature financial engineering techniques	(1) Complexities in project financing; (2) long time and possibly long delay in reaching financial closure; (3) lack of clarity on funding systems to allow public bodies to service tolls/tariffs; (4) inappropriate accounting treatment of PPP projects; (5) lack of appropriate toll/tariff adjustment mechanisms; (6) financiers' unwillingness to accept any high risks; (7) public client's lack of appreciation of returns expected by the private sector e.g., restriction on the cap of internal rate of return; and (8) public client's misleading cost comparison with projects procured in a traditional way.
Problems related to the public sector	(1) Inexperienced government bodies and lack of proper understanding of PPPs; (2) bureaucratic attitudes and resistance to change of civil servants in host government; (3) lack of government commitment and support and full cooperation with the private sector; (4) too many institutional players; (5) host government's unreasonable expectations of the private sector; (6) general corruption and untrustworthiness of public officials; (7) counter-party risks related to the poor credit quality of local administrative bodies; (8) renegotiation of contract terms in mid-operation by public authorities; (9) lack of appropriate financial risk guarantees from the public sector; (10) inappropriate risk sharing—government may want to transfer all instead of appropriate risks to the private sector; and (11) philosophical and ideological antipathy to working with the private sector.
Problems related to the private sector	(1) Lack of people prepared for working on PPP projects and most people (including investment banks) still prefer traditional projects; (2) philosophical and ideological antipathy to working with the public sector; (3) lack of understanding among stockholders; (4) lack of managerial expertise of private sector participants; (5) inexperienced project management team; (6) poor coordination and team work within the concessionaire consortium; (7) lack of innovation; (8) construction delay; (9) inability to deliver quality service for the price offered; and (10) inability to identify and manage risks.

removing measures, has been developed through the above-mentioned systematic approach. The nine aspects (discussed in detail in the following sections) are:

1. appropriate roles of governmental authorities;
2. best value for money approach;
3. effective management of adviser services;
4. development of an appropriate PPP scheme;
5. use of relational contracts;
6. improvement of the procurement framework;
7. suitable payment structure;
8. appropriate terms for contract monitoring, termination, and step-in rights; and
9. workable transfer management procedures.

### Appropriate Roles of Governmental Authorities

The government plays an important role in alleviating political risks and creating a favorable social, legal, economic, and financial environment for PPP infrastructure development.

### Adequate Legal and Regulatory Framework

The willingness of the private sector to take part in PPPs depends very much on the environment where the projects operate. There-

fore, governmental authorities should make efforts to develop a legal and regulatory framework and create a social and economic environment that are conducive to investment and attractive to private investors. An adequate legal framework means that PPP participants can structure a contractual vehicle that is compatible with that country's laws. Corruption may be spawned by the lack of an adequate legal framework. This is detrimental to the interests of both the public and private sectors.

### Central Coordinating Governmental Authority

Strong government initiatives are needed in PPPs, especially in a country that lacks an adequate legal system to regulate such schemes. It is useful to establish a central coordinating governmental authority (CCGA) to coordinate privatized projects by preventing the duplication of administrative functions and streamlining the institutional framework. For example, in the United Kingdom, the HM Treasury established a taskforce in 1997 to oversee its PFI program. In the Philippines, the BOT Center was established in 1993 to further promote its national BOT program. The CCGA should have adequate power to coordinate, reconcile conflicts, and to address issues that the individual governmental departments or project participants are not capable of handling in isolation. However, the power of the CCGA should be balanced

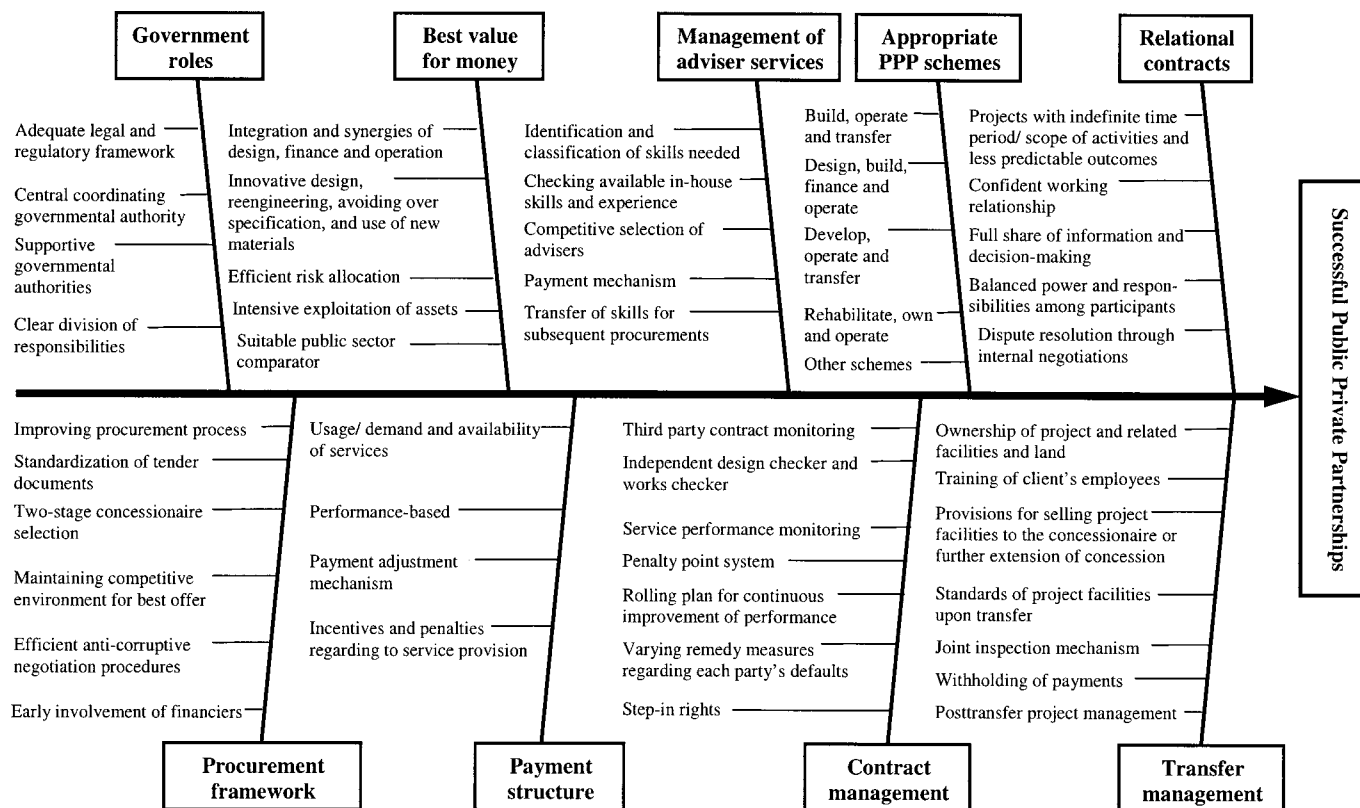


Fig. 1. Improved protocol for infrastructure development through public-private partnerships

and appropriate to its roles in relation to the parties closely involved in PPP projects. Inappropriate intervention of the CCGA in a PPP project may disconcert the public client and threaten the private participants as well. The CCGA, as a PPP regulator, should create a favorable environment for fair PPP transactions and play the role of an arbitrator in settling disputes rather than merely protecting the public interest.

### Supportive Governmental Authorities

Relevant governmental authorities should provide necessary support to project participants on key PPP issues, including training on the principles and processes of PPPs; examination of the commercial viability of different kinds of projects; development of standardized model contracts and other tender documents to reduce transaction costs (e.g., tendering costs and legal fees); examining and making recommendations on the removal of the existing unnecessary legal and financial barriers to PPPs; assisting relevant parties in formulating manageable project packages; and establishing and updating guidelines for improved practices. For example, the Philippine BOT Center offers services of BOT data base creating, technical assistance, policy advocacy, marketing and promotion, and training (Briones 1997). In addition, country and project specific governmental guarantees and support may also be necessary to manage certain risks that can be better handled by the government, for example, changes in law, foreign currency convertibility, corruption, delays in approval of various permits, expropriation and nationalization, and certain force majeure risks.

The CCGA together with relevant departments may develop some pathfinder projects in selected key sectors. These projects can be used as models for future projects through the dissemina-

tion of standardized tender documents and model contracts, and best practice guidelines. For example, the central government of China initiated a national BOT pilot program in 1995 (Zhang and Kumaraswamy 2001).

### Clear Division of Responsibilities

The PPP projects involve different governmental departments at both the central and local levels and various types of participants from the private sector. Each party has its own objective and interest. Concerted efforts are needed to achieve win-win results. The lines of authority, responsibility, and communication should be well defined among the coordinating authority, relevant governmental departments, the public client that sponsors a project, the private participants, and internal and external advisers of either the public or the private sector. Clarity in the division of functional responsibilities of different governmental departments is essential to promoting and smoothing private sector participation in public infrastructure development. Clarity requires a system that can assign responsibilities to various departments concerned and enable them to perform successfully their assigned tasks or to "fail openly" if they undertake them poorly (*Better urban services* 1995).

### Best Value for Money

The PPPs transfer much more project functions and substantial risks to the private sector and thus provide more scope for private sector innovations for potentially increased value to both the public and private sectors. The public client should adopt a best value



source selection (BVSS) approach, in which the public client only needs to identify core requirements or minimum service standards and allow private sector participants to make their discretions as to whether offering higher standards. This BVSS necessitates an innovative tender evaluation methodology. The general principle is that tender price (the net present value of the payments to the concessionaire over the contract period) is the determinant criterion if minimum technical standards are satisfied, while the technical standards determine the main difference between tenders if tender prices are in the same band. A benefit/cost analysis should be conducted when higher standards are offered at higher prices. Public clients, governed by the public accountability principle, cannot just pay higher prices for better value without justification. Furthermore, conflicts may exist among various objectives in the BVSS. A tradeoff among multiple objectives may be necessary; for example, the client may opt for a desired value instead of the best value due to various constraints.

It is held that better value for money can be achieved from: (1) integration and synergies of design, build, finance, and operation; (2) innovative design, re-engineering, avoidance of overspecification, new materials, or more efficient management; (3) efficient allocation of risks to the parties who are best able to manage them; and (4) more intensive exploitation of assets (*Partnership for prosperity* 1997).

Public clients should determine whether a particular PPP scheme can achieve better value than a traditional procurement route (e.g., the design-bid-build contract). In the United Kingdom, this is checked by comparing with a public sector comparator (PSC). For example, in the DBFO roads, the net present value of the projected payments over the DBFO contract life (25–30 years) is compared with that of the costs of a traditionally procured PSC over the same length of period. The PSC costs also include risks borne by the Highways Agency under the conventional procurement and other unquantifiable value factors (e.g., environmental and other policy objectives). Alternative benchmarks may be used, for example, to compare with a similar recent privately financed project or with information on costs and rates of return that are available in the current market (*Technical note 5* 2000).

### Effective Management of Adviser Services

Many public clients still lack adequate experience and expertise in PPP projects. External advisers may be necessary. However, consulting fees are much higher for PPP projects because of expanded roles of legal and accounting professionals than for a traditional public project in which the roles of advisers are well defined. For example, advisers work at 1999 hourly rates is well below £100 in traditional projects, while their hourly fee rates are often as high as £200–£300 in PFI projects (Blackwell 2000). Transaction costs are also very high for PPP projects because each party has a number of legal, financial, technical, and management advisers and consultants. Huge adviser costs may be incurred when there is a dispute in the PPP contract. For example, the adviser costs of the first 15 NHS PFI hospitals were £45.2 million, which consisted of £20.4 million fees for lawyers, £14.6 million for financial advisers, and £10.2 million for management consultants and other advisers. Adviser's fees represented between 2.4 and 8.7% of the capital cost of these projects. Furthermore, the costs do not include public sector staff time in developing PFI projects and the cost of the procurement process (Whitfield 2001).

To reduce consulting fees and transaction costs, an effective and efficient adviser management procedure should be developed for the accreditation of external advisers and for the definition of the roles of different types of advisers. For example, in the United Kingdom, an assessment of the quality of external advisers is established as a criterion in the examination of the commercial viability of significant PFI projects. The role of advisers should be kept within the scope of their expertise. Incompetent advisers or inappropriate advisory roles would increase project costs and delay the procurement process. It was observed that a number of PFI projects had been hampered by the engagement of unqualified advisers who were “learning at the public sector's expense” and incapable of providing timely quality advice. Technical advisers had been inappropriately asked to prepare contract drafts and financial evaluation models that were beyond their expertise such that much of the legal and financial work had to be redone, resulting in considerable extra costs (Bates 1997; *Technical note no. 3* 1998).

### Development of Appropriate Public–Private Partnership Scheme

A number of PPP scenarios are available for infrastructure development. These include buy–build–operate, build–lease–transfer, build–own–operate, build–own–operate–maintain, build–own–operate–transfer, build–transfer, build–transfer–operate, DBFO, design–build–operate–maintain, develop–operate–transfer, lease–develop–operate, rehabilitate–own–operate, rehabilitate–operate–transfer, and transfer–own–transfer. The differences of these schemes are discussed in Palaneeswaran et al. (2001). Public clients should examine carefully which schemes are suitable (after appropriate modifications and innovations) for projects under their consideration in light of the features of the projects and the country- or sector-specific conditions. Table 3 compares some PPP schemes used in China, the United Kingdom, and the United States.

### Use of Relational Contracts

General and/or industry-specific PPP guidelines, standardized tender documents, and model contracts have been established in different countries. This facilitates infrastructure development through complete contracts, which are more suitable to large projects that are amenable to full specification ex ante, with relatively predictable and measurable outcomes and clear lines of authority and responsibility. However, as mentioned above, high transaction costs are a key feature of long-term complete PPP contracts. “Relational” (incomplete) contracts may be more useful for PPP projects with indefinite periods of time for activities whose scope cannot be fully specified in advance and whose outcomes are less predictable. Furthermore, there is more scope for relational contracting in a series of projects running in sequence (Mumford 1998). The main differences between complete and relational contracts are shown in Table 4.

Successful relational contracting requires a cooperative working relationship, full share of information, and balanced power among the main participants, who collectively make decisions, share benefits, take corresponding responsibilities, and resolve disputes through internal negotiations. It should also be noted that there is still no matured theory on relational contracts to date. For example, one problem is that banks and other financial institu-

**Table 3.** Comparison of Public–Private Partnership (PPP) Schemes Used in Different Countries

Private finance initiative projects in United Kingdom	Toll roads in the United States	Build–operate–transfer (BOT)-type projects in China
<p><i>Design–Build–Finance–Operate (DBFO) Model</i> For a financially freestanding project, the concessionaire designs, builds, finances and operates it, recovers investments and obtains profits entirely through direct charges on end users. Public clients provide necessary assistance in statutory procedures without assuming other risks. Title to real estates involved in the project does not pass to the concessionaire but is leased from the client. Examples include the Second Severn Bridge, the Dartford River Crossing, and the Royal Armories.</p>	<p>The Intermodal Surface Transportation Efficiency Act implemented in 1991 creates a framework of PPPs in toll roads. It allows for a number of procurement models, including BOT (build–operate–transfer), BOO (build–own–operate), BBO (buy–build–operate), and LDO (lease–develop–operate). Examples include the Dulles Greenway in Virginia, the Santa Ana Viaduct Express (SR 57), Mid-State Tollway (I 80), San Miguel Mountain Parkway (SR 125), and SR 91 Median Improvement (SR 91) in California, and the Conway Bypass, Sea Islands Expressway and Southern Connector in South Carolina.</p>	<p><i>Sino-Foreign Joint Venture (JV) BOT Projects</i> JV BOTs were first explored in the 1980s. Chinese parties contribute development costs, mining and land use rights, certain construction costs and labor costs. Foreign parties input cash, equipment, design of facilities and technical assistance. The project agreement usually includes an umbrella guarantee from a Chinese financial institution and a take-and-pay contract where necessary. Examples include transportation projects, power stations and water treatment plants.</p>
<p><i>Joint Venture</i> For projects whose costs cannot be recovered entirely through charges on end users the government provides subsidies (only towards asset development) for social benefits not reflected in the project cashflows (e.g., environment improvement and economic regeneration). Government may also share a certain percentage of service benefits or a minimum direct financial reward from the project. Examples include joint venture business park developments, city and town center regeneration schemes, Manchester’s Metrolink and the Docklands Light Railway Extension.</p>	<p>BTO (build–transfer–operate) is preferred over BOT in the State of California because the BTO would keep ownership and thus tort liabilities of the project with the state upon construction completion and this avoids higher tolls incurred by the prohibitive insurance costs borne by the concessionaire to cover tort and other liabilities such as highway accidents and related property damages.</p>	<p><i>BTO Scheme in Telecommunications</i> BTO scheme is adopted in the telecommunications sector based on a JV model established by foreign investors and a licensed Chinese operator who contributes its telecommunications operation license to the JV. The JV builds the network, ownership of which is transferred immediately to the Chinese operator at no cost upon construction completion. The JV is then granted a concessions to operate the network for a fixed period. One flaw inherent in BTO is the increased financial costs to the concessionaire due to a lack of asset ownership and the disincentive to invest additional capital in the network as the contract approaches to the end.</p>
		<p><i>TOT Scheme for Project Acquisition</i> TOT (transfer–operate–transfer) allows foreign investors to buy existing project facilities, operate them over a specified period and then transfer back at no costs to the government. The 250 MW Laibin A power station in Guangxi is the first TOT project in China.</p>
		<p><i>Wholly Foreign Funded BOT Projects</i> Some pilot BOT projects selected from the power, water treatment of transport sectors (e.g., Laibin B power station) have been developed under a national experiment BOT program launched in 1995. These projects are of sole foreign ownership and guaranteed foreign exchange convertibility for debt service and equity returns by relevant Chinese government authorities.</p>

tions may not be willing to participate in relational projects in view of the lack of an assuring security package in relational contracts. Therefore, a mutual trust among public client, private participants, and financial institutions needs to be built up through their past experience before relational contracts can be explored.

### Improvement of Procurement Framework

Procedural and legal complexities often retard the PPP progress. For example, in the United Kingdom, two independent reviews of the PFI have been conducted to identify obstacles and make spe-

cific recommendations to streamline the PFI process (Bates 1997, 1999). The following pointers are useful in the formulation of an efficient procurement framework for PPPs (Bates 1997, 1999; *DBFO* 1997; Blackwell 2000):

1. standard format and appropriate wording of project advice-ment to allow flexibility in contract negotiations;
2. standard procedure for obtaining information from prospec-tive tenderers;
3. establishment of industrial sector-specific model contract conditions;
4. market testing before the start of a competitive tendering process;

**Table 4.** Comparison of Complete and Relational Contracts (Based on Mumford 1998)

Complete contracts	Relational contracts
Suit single projects	Suit series of projects
Require full prespecification	Need less full specification
Ex ante agreement needed	Expect frequent renegotiations
Rules laid down in advance	Flexible rules agreed internally
Duties clearly defined	Duties may be indefinite and shared
Rewards preallocated	There may be bargaining over rewards
Risks assigned	Risks may be shared ex post
Use third party verification	Third party monitoring may be difficult
Enforcement by courts/ alternative dispute resolution	Parties need to resolve their own disputes
External power invoked	Parties share power amongst themselves
Net present value readily estimated	There are likely to be many "real options"
Finite contract duration	Open-ended contracts

5. efficient management procedure of external advisors;
6. clear definition of project core requirements and derivation of project-specific concessionaire prequalification and selection criteria;
7. maintaining competitive environment throughout the tendering process while remaining sensitive to tenderers' costs;
8. full impact assessment of possible delays in key activities and relevant contingency arrangements;
9. effective anticorruptive negotiation process; and
10. early involvement of financiers in the procurement process.

### Standardization of Tender Documents

One of the cornerstone recommendations of the Bates reviews is the development of established sets of standard model contract terms and conditions for a range of sectors, for "parties involved in PFI from both the public and private sectors have been crying out for standardization of contract documentation for some time" as said by Adrian Montague, Chief Executive of the HM Treasury's PFI Taskforce ("Standardization" 1998). Standardization of tender documents will reduce costs to the private sector in formulating bids and to the public sector in assessing them. This will also greatly reduce other transaction costs and facilitate subsequent project documentation. The more the public sector can produce workable standardized tender documents the shorter and less protracted the period leading to financial close. However, standardization of tender documents should not stifle innovation on the private sector side ("Standardization" 1998).

### Two-Stage Concessionaire Selection Process

Tendering costs for PPP projects are very high, in some cases as high as 10% of the total project costs (Merna and Smith 1996). Therefore, it is necessary to reduce through a prequalification process the number of tenderers before they incur major costs. Results from one of the other parts of the questionnaire survey show that three or four shortlisted consortia are an optimal number to be invited to submit tender proposals (Zhang 2004). This ensures a healthy competition while providing the selected consortia a sufficient chance of success to ensure their commitment to the usually long and expensive selection process.

This concessionaire selection process can be achieved in two stages. In the first stage, each responding consortium and its con-

stituent members are evaluated of their technical, financial, and managerial track record on similar projects involving construction, maintenance, operation, finance, quality control, and safety responsibilities. Each consortium is required to fill in a prequalification questionnaire. Submitted questionnaires are first assessed in a qualitative way for their compliance with the client's basic requirements. Noncompliant questionnaires are removed. In the second stage, the remaining consortia are required to submit outline tender proposals that are subsequently assessed to examine their understanding of and their perceived approaches to key issues in the project development. These proposals are evaluated in various assessment areas against different evaluation criteria using a scoring system.

### Maintaining Competitive Environment for Best Offer

Although the number of consortia invited to submit tenders should be kept as few as possible to reduce costs to the industry, a competitive environment should be maintained throughout the tender evaluation process with an aim to achieve the best offer. In the PFI, public clients usually do not award immediately the contract to the tenderer with the highest score after initial tender evaluation. Instead, the client appoints the highest-score tenderer as the preferred tenderer while at the same time keeps the next favorable tenderer as the reserve tenderer. The preferred tenderer is informed of the existence of a reserve tenderer and vice versa. The client could invite the reserve tenderer for further negotiations toward a signed PFI contract should negotiations with the preferred tenderer fail to reach a close. However, the reserve tenderer is not allowed to reopen previously agreed issues in order to improve its position. A tenderer should satisfy the following criteria to be selected as the preferred tenderer and subsequently awarded the contract: (1) meeting output specifications, (2) whole life value for money, (3) acceptance of key contract terms and required transfer of risks, (4) confirmation of access to finance, (5) unitary charge affordable to the public client, and (6) a cohesive consortium (*Technical note no. 4* 1999).

### Efficient and Anticorruptive Negotiation Procedures

To achieve the best value, public clients may only indicate their basic requirements in tender documentation. Even if public clients may also provide a "conforming" or "illustrative" design, alternative proposals should be encouraged. For example, the Hong Kong government also considers a hybrid scheme incorporating features from any conforming and alternative proposals submitted, subject to agreement with the tenderers involved (*Western Harbor Crossing project brief* 1992).

Well-defined staged negotiation process should be followed. The first round negotiation may shortlist tenderers to two (the potential preferred tenderer and reserve tenderer) by focusing on allocating risks and checking whether a proposal can achieve better value for money than a conventional scheme. The second round negotiation requests the two remaining tenderers to provide their best and final offers (BAFOs) that are backed by their respective financiers. This round involves significant legal and financial inputs. The third round negotiation is with the preferred tenderer and its financiers to finalize contract terms based on its BAFO.

It should be noted that endless negotiations beyond an optimal point increase costs for both tenderers and the client alike, and increase the chance of withdrawing tenderers. Legal impacts should also be fully assessed and appropriate measures taken to



ensure the understanding of all parties involved. In addition, although value for money and transfer of risks should be the basis to select the most suitable concessionaire, a common sense and open approach based on mutual trust rather than an adversarial over-detailed approach would benefit both the public and private sectors (*Technical note no. 4 1999*).

Furthermore, it is claimed that corruption may be inevitable with a number of partnerships and nonaccountable quasipublic organizations responsible for large sums of public and private money, and negotiations often conducted behind closed doors under a blanket of "commercial confidentiality" (Whitfield 2001). Therefore, the government should develop new codes of conduct and take effective measures to prevent corruption. For example, in Hong Kong, the whole project procurement process is monitored by the Independent Commission against Corruption.

### **Early Involvement of Financiers**

Financiers play a significant role in PPP infrastructure projects, for they provide a large percentage (sometimes 90% or more) of the total funds required. They demand significant inputs into the terms of the commercial deal. There are significant discussions and negotiations on lending terms and due diligence between tenderers and their financiers, which take a long time. Early involvement of financiers helps to streamline the whole project procurement process and overcome timing difficulties. Key contractual terms should have been agreed on by the tenderer and its financiers, and the financiers should also have tested the robustness of the financial model and confirmed their commitments to the project before the announcement of the preferred tenderer or the winning tenderer.

### **Payment Structure**

The payment structure is particularly important to PPP projects. It should be devised so as to safeguard the interest of both the public and private sectors. The general strategy is to link payment to service delivery. This ensures that the concessionaire will continuously improve performance and deliver quality services, and enables it to obtain a reasonable but not excessive return that reflects its performance.

### **Usage/Demand and Availability of Services**

The payment should reflect the quantity of usage or demand of the public client (or the customers) and the availability of services. For example, in the DBFO road in the United Kingdom, different levels of shadow tolls are paid for different traffic bands depending on the length of vehicles. For existing stretches (if any) of the DBFO road, reduced shadow tolls that only meet the operation and maintenance costs of the existing stretches are paid prior to completion of the new construction. The concessionaire receives 80% of the full traffic payment once the permit to use is issued for the new built section(s) of the DBFO road. It receives 100% payment when construction works are completed and the completion certificate is issued (*DBFO 1997*).

### **Performance-Based Payment**

The payment should also reflect the quality of services and base on the concessionaire's performance. For example, in the DBFO roads, the United Kingdom Highways Agency encourages the

concessionaire to enhance safety performance by paying 25% of the economic costs of the personal injury accidents avoided in the 5 years following the year in which the concessionaire initiated safety measures. On the other hand, payments will be reduced if the number of accidents on the DBFO road is higher than the national average for a similar type of road. In addition, toll payments are also reduced for lane closures that are within the control of the concessionaire, taking into consideration the number of lanes closed, the duration of closure, the expected traffic at the time of closure, and the economic value of user delays that can differ between business and leisure uses (*DBFO 1997*).

### **Payment Adjustment Mechanism**

A payment adjustment mechanism is necessary to protect the interests of both the public and private sectors. It ensures that the concessionaire's return be reasonable but not excessive. In DBFO roads, zero toll level is set for top band (exceeding certain vehicle kilometers p.a.) to cap the maximum liability of the United Kingdom Highways Agency (*DBFO 1997*). In recent BOT tunnel projects in Hong Kong, the Highways Department initiated an automatic toll adjustment mechanism. In this mechanism, the government and the concessionaire agree upon a maximum and minimum level of "estimated net revenue" (ENR) for each year, and a defined number of "anticipated toll increases" (ATIs) on specific dates during the concession period and the amount of each ATI. At the end of each operation year, the concessionaire submits to the government an audited statement of its "actual net revenue" (ANR) for that year. The concessionaire has the option to implement an ATI on the specific date provided that the ANR is below the maximum ENR for the year prior to this date. The concessionaire could also bring forward an ATI in a previous year should the ANR fall below the minimum ENR. However, if the ANR in any year is in excess of the maximum ENR, all excess revenues are paid into a toll stability fund. The government has the sole right to use the fund to stabilize tolls by deferring an ATI or bringing it forward by paying the concessionaire the difference between the maximum ENR and the ANR for the year concerned (Kumaraswamy and Zhang 2001).

Furthermore, the payment adjustment mechanism can also address changes that may occur from either the public or the private sector over the long concession period. First, changes caused by either sector should be verified in terms of corresponding costs and/or demand. Then, the revised costs and/or changes in anticipated revenues to the concessionaire are put into a financial model to establish a revised profit level to the concessionaire. Finally, adjustments are made to future toll/tariff levels (either up or down) to ensure that the profit level to the concessionaire is the same as before the eligible change.

### **Contract Monitoring, Termination, and Step-In Rights**

#### **Contract Monitoring**

Specific terms should be included in the PPP contract to allow the monitoring of the concessionaire's performance against its contractual obligations after contract award. To ensure fairness the public client may remain as "hands-off" as possible in monitoring the contract by appointing representatives to undertake this task. In BOT tunnel projects in Hong Kong, the government requires the concessionaire to employ an independent design checker and



**Table 5.** Comparison of Transfer Practices of Public–Private Partnership Projects in the United Kingdom and Hong Kong

Design–Build–Finance–Operate (DBFO) road in United Kingdom	Build–operate–transfer (BOT) tunnel in Hong Kong
<p>The United Kingdom Highways Agency retains ownership of the DBFO road and underlying land throughout the life of the DBFO contract while the concessionaire has the right of access to the road and necessary land. At the end of the contract term the project road and all fixed facilities on it will be handed over to the Highways Agency and the concessionaire's right to access terminates without cost to the Highways Agency. A joint inspection of all project facilities takes place around 18 months before contract expiry. From 5 years before expiration, the Highways Agency can withhold 40% of payments due to the concessionaire, up to an amount equal to 40% of the estimated value of remedial works, and apply these funds to remedy defects if transfer criteria are not met at contract expiry. The Highways Agency issues a handback certificate if the transfer criteria are met on the expiry of the contract period.</p>	<p>The Cross Harbor Tunnel (CHT), the first BOT tunnel project in Hong Kong, was transferred to the government in 1999 after a 30-year concession period. The following critical issues were addressed to ensure a smooth transfer: (1) legislation for future management of the CHT, (2) preparation of tender documents for a management–operation–maintenance (MOM) contract for posttransfer operation of the CHT, (3) agreement on the list of assets to be transferred, (4) following up on outstanding maintenance works with the concessionaire, and (5) smooth transition of the concessionaire's staff.</p> <p>The Road Tunnels (Government) (Amendment) Ordinance was promulgated in 1999, enabling the imposition by the government of fees and charges for use of the CHT as a public tunnel and empowering the Commissioner for Transport to deal with management, operation and maintenance issues upon transfer. A new operator was selected after a competitive tendering process. The government and the new operator signed a 2-year MOM contract, under which the government owns the CHT and the operator manages, operates, maintains, and collects tolls on behalf of the government. The government has established specific requirements for the operator's routine inspection, scheduled maintenance and repair work and relevant payment methods. Nonscheduled maintenance and repair work will be paid separately after prior check and approval by the government.</p>

an independent works checker to ensure quality design and construction. The government also establishes a monitoring team to monitor the performance of the concessionaire during the operation period.

A penalty point mechanism is included in the DBFO contract in the United Kingdom. Penalty points are assigned to the concessionaire when it fails to perform its obligations in terms of availability of services and quality. The accumulative penalty points above a specified threshold within a certain period will trigger increased monitoring or even result in the client's terminating the contract without compensation. In addition, the client may require the concessionaire to make rolling plans for continuous performance improvement and request end users to monitor the concessionaire's performance against these plans.

### **Contract Termination and Step-In Rights**

Contract provisions regarding each party's defaults should give the other party the right to remedy or even to terminate the contract. The concessionaire's defaults may include insolvency and serious breach of its obligations such as failing to complete construction by a long period or exceeding a maximum number of penalty points within a specified period. The client may choose varying remedies to address these defaults, including issuing a warning, requesting the concessionaire to rectify within a given time, reducing/suspending payments, taking appropriate actions itself and invoicing the concessionaire for relevant costs, and terminating the contract without compensation. The client's defaults that allow the concessionaire to terminate contract with compensation include sequestration of the project by the state or failure to pay service charges due to the concessionaire within a specified period. Events such as force majeure or change in law that cause both parties to be unable to perform their contractual obligations should enable either party to terminate the contract (*DBFO 1997*).

### **Transfer Management**

For PPP projects that have an element of "transfer" appropriate provisions should be included in the contract. Innovative transfer arrangements ensure continuation of efficient project operation and quality service provision beyond the concession period. Provisions may include: (1) ownership of the project, related facilities, and the underlying land; (2) training of the public client's personnel; (3) a provision that allows the client either to sell the facility to the concessionaire at a predetermined cost or to further extend the concession period for which the concessionaire provides a guaranteed return to the client; (4) standards that the project facilities must meet at the time of transfer based on the residual life of the different components of the project facilities; (5) a joint inspection mechanism towards the end of the contract term; and (6) withholding payments due to the concessionaire for a specific number of years immediately before contract expiration. Table 5 compares the transfer practices of DBFO roads in the United Kingdom and BOT tunnel projects in Hong Kong.

### **Conclusions**

Various barriers to PPPs have been identified, which are broadly classified into six categories: (1) social, political, and legal risks; (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. Effective measures for removing these barriers and formulating an efficient PPP protocol have been identified and analyzed by drawing experience from worldwide practices and comparing and benchmarking the best practices. These measures are classified into nine areas: (1) appropriate roles of governmental authorities; (2) best value for money approach; (3) effective management of adviser services;

(4) development of an appropriate PPP scheme; (5) use of relational contracts; (6) improvement of the procurement framework; (7) suitable payment structure; (8) appropriate terms for contract monitoring, termination, and step-in rights; and (9) a workable transfer procedure.

Governmental authorities play an important role in creating a favorable social, political, legal, and economic environment and an effective institutional framework for PPPs, which will minimize various risks and safeguard win-win results to both the public and private sectors. The public client should take the best value approach and choose a suitable PPP scheme, taking into consideration the characteristics of a particular project and the country- or sector-specific conditions. A results-oriented specification of the client's fundamental requirements rather than a high degree of technical specifications encourages private sector innovations for potential best value for money.

The procurement process should be streamlined by standardizing tender documents, maintaining competitive environment, using efficient and corruption-proof negotiation procedures, and involving financiers at an early stage. High transaction costs are a key feature of long-term complete PPP contracts. The standardization of tender documents can significantly reduce tendering costs, legal fees, and other expenses. However, standardization should not stifle private sector innovations. The use of relational contracts may significantly reduce transaction costs for a series of projects running in sequence. Transaction costs can also be greatly reduced by appropriate management of external advisers.

A well-designed payment structure should link payments to service delivery for continuous improvement in concessionaire performance. In addition, specific terms should be included in the PPP contract to allow the monitoring of the concessionaire's performance against its contractual obligations. Contract provisions on each party's defaults should give the other party the right to take appropriate remedial measures. Furthermore, an innovative transfer package ensures continuation of efficient project operation and quality service provision beyond the concession period.

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