

CONCEPTUAL FRAMEWORK FOR CONSTRUCTION PUBLIC PRIVATE PARTNERSHIPS

Bing Li¹, Akintola Akintoye² and Cliff Hardcastle

Department of Building and Surveying, Glasgow Caledonian University, Glasgow G4 0BA, UK

Construction projects are typically financially expensive, that governments both in developed and developing countries, for pragmatic reasons are now adopting public-private partnership to fund public sector projects. The forms of public-private partnerships (PPPs) and the use in many countries and industries are increasing as part of the policies towards decentralisation and deregulation. A three-year research programme is currently underway at the Glasgow Caledonian University to develop an organisational framework for construction PPP and model associated risk management. The purpose of this paper is to rationalise the concept and structure of PPPs, and to use this as a basis for continuous research. Based on a literature review of work already done in the subject area, a conceptual framework for PPP is presented. In addition, the paper describes some main issues involved in construction PPPs, including the reasons for the public and private sectors' involvement and associated risks.

Keywords: procurement, public good and service, public private partnership, risk, success factor, public sector, BOT

INTRODUCTION

Rapid growth in demand for infrastructure has been a common theme in recent decades in developing countries. It is a recognised fact that many governments are short of financial resources, technological and efficient management skills in their infrastructure and other construction project developments (Roth, 1987). They are now seeking the international company, private sector and other non-profit organisations to help finance their projects and achieve technology transfer. The developed countries' governments, for the purposes of delivering higher quality and more cost-effective public services are encouraging private sector involvement in the provision of financing and management of public sector infrastructure through PPP (HM, 1995).

There is no single definition of the term "public private partnership". The term should be viewed as a spectrum of possible relationships between public and private actors for the co-operative provision of traditionally public-domain services. Gentry and Fernandez (1997) described Construction Public-Private Partnerships as private participation in the design, financing, construction, ownership, and operation of a public purpose facility or service. These arrangements vary from contracting out, mixed-capital public private joint ventures, Build-Operate-Transfer (BOT), lease-develop-operate, and full privatisation.

¹ Email: b.li@gcal.ac.uk

² Email: akin@gcal.ac.uk

This paper conceptualises PPP by posing some questions on the co-operative relationship. Why are PPPs being used? How are they organised? What are the conditions for success? What are the major risks of this new form of procurement? Figure 1 shows a framework to establish the concept of PPPs.

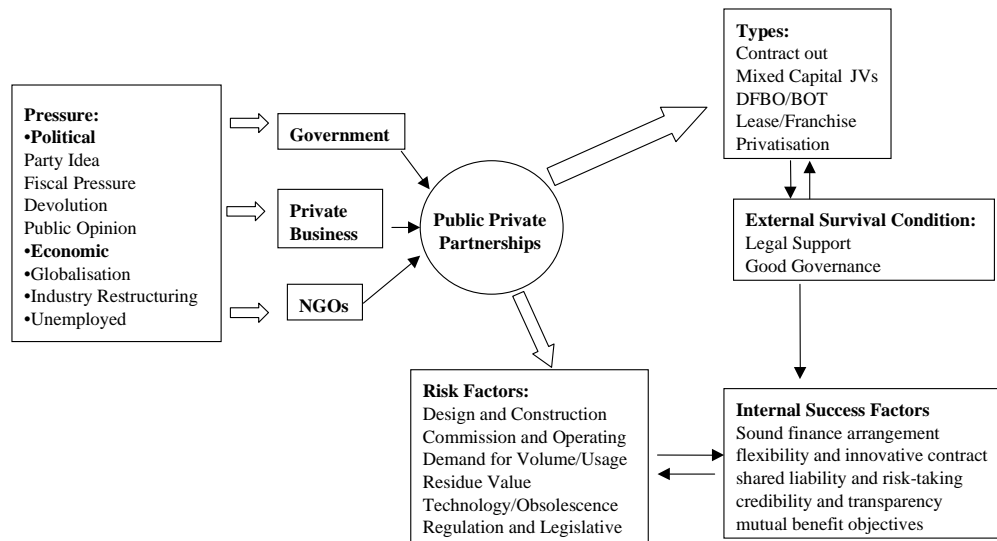


Figure 1: Conceptual Framework for Construction PPP

PHILOSOPHY OF PRIVATE PARTICIPATION

The use of PPPs generally falls into the field of public goods and service provision. The public goods or services includes the provision of infrastructure such as roads, telecommunication, waste management, energy generation, water supply, etc. Building projects such as hospitals, schools, housing and public buildings are also included.

Current trends in global competition suggest that the private business entities are finding it difficult to stand steadily by acting alone. Both public and private business entities have recognised the crisis (Gentry and Fernandez, 1997) and are now making alliances to secure competitive advantage. The lines between public and private have grown blurry, alliance and co-operation are often seen occurring in government and private entities, so much so that the private sector is now taking the lead in partnering with the government. Figure 2 shows a trend in the working relationship between the private sector and the public sector from a position of conflict to a formal partnership.

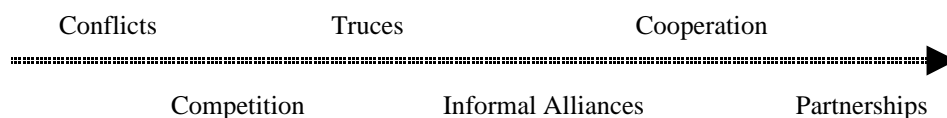


Figure 2: Private and Public Sectors Relationship Development (Adapted from Walsh, 1995)

Political pressure for PPP development

The extent and nature of the change in the management of public service is dependent on the existing institutional framework and the structure of the political and administrative system (Walsh, 1995). Newman and Verpraet (1999) have argued

strongly that national political and cultural factors distinguish different forms of partnership in different countries. In developing countries, fiscal pressures are the main problems faced by governments on urban development (Bahl and Linn, 1992). In a highly welfare country like Sweden, Collin (1998) found that local government had two major reasons for becoming involved with PPP. Firstly, gaining resources (monetary capital, competency, or a commercial mental disposition) and secondly, gaining competitive equality.

PPP, and of course privatisation, is generally more likely in countries with a strong private sector which can put pressure on the government, or where large international companies can have an influence. For example, this has been the case of French and British water companies in South American and South-East Asia (Walsh, 1995). The party political and ideological framework is important in the process of change. The less established is the social democratic and static pattern of a government, the easier it is to change to a more market-based approach (Walsh, 1995). Public opinion may have both a positive and negative influence on change, but the majority do favour giving private firms the opportunity to show whether they can provide public services more cheaply (ICM, 1993).

Economic pressure for PPP development

Structural change in western economies has made it more difficult for national governments or “national” firms to protect their markets. Increasingly, businesses and localities have to compete on a global stage. The declines of many older industrial areas brought the problems of unemployment. It is crucial for governments to overcome problems of market failure at both local and national level. (Bennett and Krebs, 1991). PPP provides public-private co-operation to address both the government and private sector economic concerns. The co-operation is either public sector-led initiatives or partnerships of public sector bodies and enterprise boards.

In public sector-led initiatives, the governmental body determines general aims, specific targets and monitors implementation. This may be in association with businesses in defining goals, and involves business in implementation. An example of this is the European Regional Development Fund (ERDF) initiatives for infrastructure and redevelopment of member countries. Partnerships of public sector bodies and enterprise boards have emerged where a government body or a local government has sought to act independently of existing business interests to stimulate business start-ups and growth. Some examples are the West Midlands Enterprise Board, Merseyside Enterprise Board in Britain and the Regionaler Entwicklungsfond Marburg in Germany (Bennett and Krebs, 1991). These activities are run as independent boards or companies where start-up finance is provided by local government which is used as venture capital from which future returns will be derived.

External Survival Environment for PPPs

PPPs are difficult to survive in a strictly legal environment or where there is poor governance. The opportunities for the private sector are largely constrained by the legal environment.

Legal Requirements

According to Jones et al (1996), established national and outdated legal systems act as strong barriers to private sector participants. Past experience suggests strongly that the “wrong” legislative provisions can inhibit such PPPs whereas the “right” legislation can provide a meaningful impetus to their development (Finnerty, 1996).

Most legislative provisions that tend to discourage PPPs share a common flaw, misallocation of high costs and significant risks between the public and private partners, particularly in the early stage of the project. Finnerty (1996) noted that without an appropriate sharing of risks and an opportunity for the private partner to earn a fair rate of return on its investment, a partnership is likely to fail.

Several legislative provisions can be identified that can help to deal with the relatively high business and regulatory risks and thereby, encourage PPPs. This includes:

Allowing a private entity to propose what it believes is a financially viable project

Providing government assistance in planning, obtaining permits, acquiring land, and resolving intergovernmental and interagency disputes.

Having the government partially or fully fund environmental and land use studies.

Providing loans to cover a portion of the project's capital costs.

Providing law enforcement services for a private project.

Deferring local property (or state) taxes.

Exempting partnership projects from sales tax on construction supplies.

Placing reasonable limitations on tort liability.

Providing free or subsidised use via lease or sale of government-owned land, or acquiring right-of-way through an eminent domain.

Allowing commercial development on the project site.

(Source: Finnerty, 1996)

Governance

In any economy, governance makes the decision processes that affect a nation's economic activity and its relationships with other nations. It clearly has major implications for equity, urban poverty and the quality of life. Politically, governance is a process of decision-making to formulate policy. Administratively, governance is the system of policy implementation. Badshah (1998) concluded that good governance is essential to attract the private sector. Mustafa (1999) put the policymakers in the apex of the UK Private Finance Initiative (PFI) structure, and recognised their dominant influence in determining the development of PPP.

Good governance is participatory, transparent and accountable. Badshah (1998) has identified characteristics of good governance for PPP. This includes:

Encouraging partnerships and creatively harnessing the private sector, both domestic and international, NGOs and private voluntary organisations.

Mobilising and leading the city residents, not only as consumers of services, but as advisors, facilitators and implementers of change.

Adopting an active procedure for achieving a desired consensus.

OPERATION OF CONSTRUCTION PPP PROJECTS

A PPP project generally passes through five phases: planning, implementation, construction, operation and transfer (Mustafa, 1999). The degree of responsibility of the public and private sector is determined by the phases involved (Figure 3). It is

possible to bring the private sector into the planning phase, however, the private sector takes on more project risks when engaged at an earlier stage (Jones, et al, 1996).

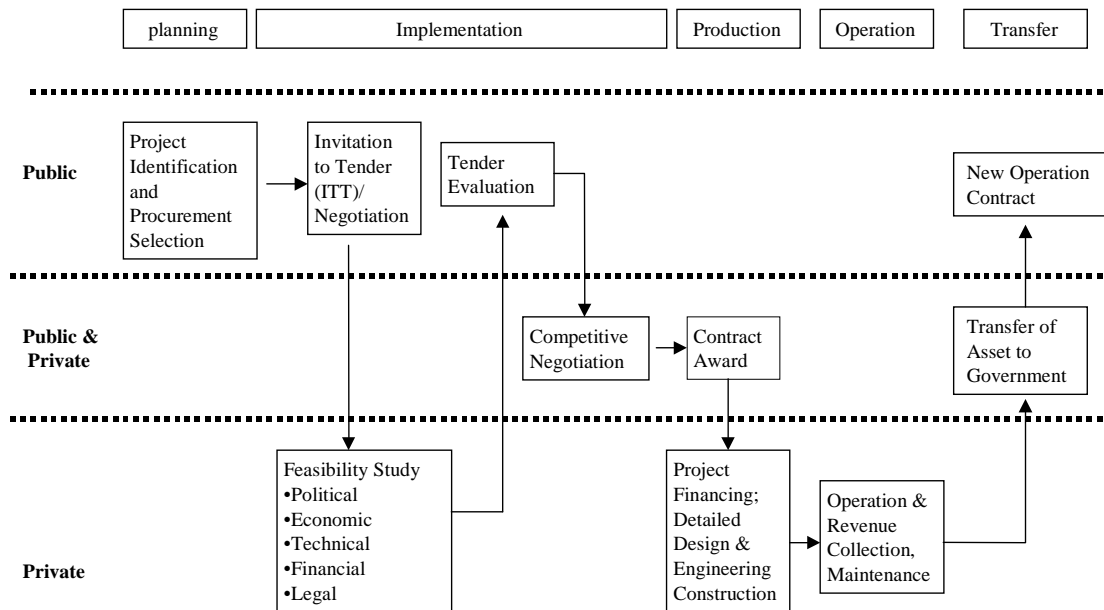


Figure3: The Phases of a PPP Project. (Adapted from Mustafa, 1999)

In the planning phase of a PPP project, the Government department clarifies the need for a project. Identifies the types, quantities, and quality of services and associated assets to be provided. Investigates the market, produces an outline plan, decides the procurement route, appoints appropriate advisors, and assembles the project teams. In the implementation phase, the private sector developer carries out a detailed feasibility study and submits a best offer. A series of negotiation are held between the participating government department and competitive private business entities. The choice of the successful bidder is based on an economically advantageous proposal, the tender that provides most value for money. Following the award of the contract, a detailed design and engineering construction work begins under design-build contract. All the risks associated with construction are transferred to the design-build contractors. A bidding consortium includes an operator who takes responsibility of delivering the service specified by the client and carrying out routine maintenance with minimum disruption to operations. At the end of the specific concession period, the asset reverts to the public sector. The government then carries out a new tendering to start another new operation contract.

PROCUREMENT METHOD

PPP arrangements vary from full private ownership (subject to government approval and oversight) to public projects, and the “core” public-private partnerships are joint ventures (Figure 4). The determinant factors for the type of a PPP include the degree of governmental control, capacities of participants to provide the desired services, legal frameworks for private investment and regulatory oversight, and availability of financial resources from public or private sources (Gentry and Fernandez, 1997). The operation of a PPP arrangement could differ based on country, and changes from one public sector to another. Figure 4 models the degree of PPP procurement and presents the degree in ascending order from left-bottom to right-top corners according to the

government's share of project responsibilities. The different arrangements represent a continuum of allocations of risks and responsibilities between public and private sectors.

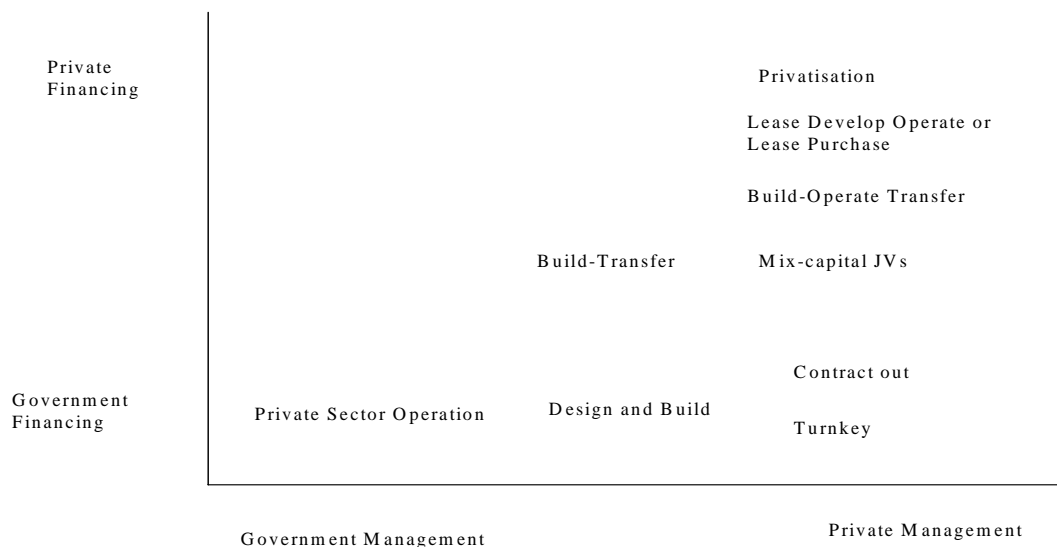


Figure4: PPPs Arrangement (Adapted from Lu et al, 2000)

Private contract operation involves a private partner being contracted to provide a specific municipal service, such as solid waste removal, or to maintain and operate a publicly owned facility, such as wastewater treatment plant. In the Turnkey arrangements, the private developer contracts to build a completely new facility in accordance with specified performance standards and criteria for a fixed price. The construction risk of meeting that price commitment is absorbed by the private sector. The private partners will be able to use fast-track construction techniques (such as design-build) and will not be bound by public sector procurement regulations.

Contracting out is the most popular type of partnership arrangement in developing countries (Gidman et al, 1997), and is currently used in developed countries, such as UK (HM, 1998). The operation of contracting out demands that it is essential to maintain some form of internal control function to monitor the contractor's performance against the contract specification, and to determine payment procedures.

In the BOT, the private partner builds a facility to specifications most likely under a turnkey arrangement, operates the facilities for a specified time period under a contract or franchise with the agency and then transfers the facility to the agency at the end of the specified time period. Lease-Develop-Operate or Lease-Purchase involves the private party in buying or leasing a facility from a public agency, modernises and/or expands it, and then operates the facility under contract with the public agency. Privatisation is the extreme type of PPP with the private sector in the dominant position and it refers to the transfer of state ownership in nationalised industries to the private sector.

FINANCIAL ARRANGEMENT IN PPP

The financial package is one of the two main components of a PPP proposal that are rigorously assessed, and normally consists of the financial and commercial aspects of the project. The financial elements would include the sources of funding, interest rate, capital structure, repayment and draw down schedules, currency of loans and payments. The commercial aspects would include, among other things, the concession

period, the toll, and the mechanism for the increase of tolls (Tiong, 1995b). An attractive financial package demands: the financial charges and interest rates of the package must be low (low cost); the package is dependent on sound and efficient financial planning and analysis by reputable bankers (credibility); minimal financial risks to the Government; and minimal burden on the debt-servicing capacity of project revenues.

A financial model is developed in mathematical equation by Ranasinghe (1999) to estimate Total Project Cost (TPC) for a PPP project as follows:

$$\text{TPC} = \text{BC} + \text{EDC} + \text{IDC}$$

Where BC is the base cost or constant value cost of the project estimated at market prices of a predetermined year, EDC is the cost escalation during construction and IDC is the interest during construction. Ranasinghe (1999) claimed this model could be used for the investment appraisal of an infrastructure project that was financed by either the public or private sector.

FUNDAMENTAL RISK FACTORS IN CONSTRUCTION PPPS

Not all PPP projects are successful, unexpected major problems can often arise during any stage of the project, particularly at the operational implementation phase. These problems jeopardise the achievement of the ultimate goal (Geijniers, 1994). It is critical for the promoters of a PPP project to know and manage the risks involved in a PPP project. HM (1995) has provided a list of six principal risks involved in a PFI project: Design and Construction Risk (to cost and time); Commissioning and Operating Risks (including Maintenance); Demand for Volume/Usage Risks; Residue Value Risk; Technology/Obsolescence Risk; and Regulation and Legislative Risks.

Within the BOT type of PPP, Tiong (1995a) noted that it is critical for the promoters to know that the ability to retain risks and offer guarantees, gives the competitive edge in a concession award. Stager (1996) summarised the problems during the execution of a Finance-Design-Build highway project in Turkey as lack of payment, ignoring contract provisions, changes in government, and politics in general. In an Indian power project, development and construction risk, operation and maintenance risk, fuel supply and transportation risk, foreign exchange risk, non-payment risk and regulatory risk, and especially political risk of local government change were identified as being most the important risk factors (Gupta and Sravat, 1998).

Lam (1999) studied 15 infrastructure developments in sectors such as power, transport, telecommunications and process plants, this was undertaken in many parts of the world using some forms of PPP approach. The study concluded that financial risks, such as interest rate fluctuation and foreign exchange fluctuation, are usually countered via a technique known as swap transactions. There are also risks which cannot be covered or mitigated such as residual risks which mostly stems from the government sides. Political risks have been seen in several cases of changing governments. Gallimore, et al, (1997) claimed risks in the PFI were those which arose with the creation of asset and existed for the duration of the project life. In the review of a heating system service in Australia, Duffield (1998) identified seven major risks in a Built-Own-Operate-Transfer (BOOT) contract with the most significant risks relating to the economy, fuel, price and interest rate changes, being passed on to the tenant. However, in a mega-project the problems may be different as suggested in Marcou's (1993) study of the Channel Tunnel.

Apart from the risk factors associated with the various types of PPP, Brodie (1995) has identified the most common mistakes that can lead either to failure or to unsatisfactory results of PPP ventures. These common mistakes include an overly optimistic procurement method, inexperienced public-sector staff; an over dependence on public finance, unrealistic demands of the public-sector, and private-sector unwillingness to contribute appropriate resources.

INTERNAL ISSUES FOR SUCCESSFUL IMPLEMENTATION OF PPPS

Several academic researchers and industrial professionals from many countries have identified some of the success factors for PPPs. In Canada, the key successful requirements identified by Tony (1996) were shared authority and responsibility, joint investment, shared liability or risk-taking, and mutual benefit to the partners. Stonehouse *et al* (1996) undertook a study based on a hospital PPP, agreed that successful PPPs require commitment, mutual understanding and a high degree of enthusiasm. In R&D, successful PPPs have six characteristics in common: a clear business agenda, strong partners committed to change, investment by both parties, rootedness in the user community, links to other organisations, and a commitment to sustain and replicate the results (Kanter, 1999).

The experience of Baltimore's Inner Harbour and Washington's Pennsylvania Avenue redevelopment exemplify the characteristics critical to the success of these and other public/private ventures (Brodie, 1995). Namely, a clear and comprehensive revitalisation strategy and plan, a strong, well-organised and targeted public entity, a thorough and realistic assessment of the costs and benefits, a project concept that is both innovative and based on local conditions, and a long-term committed private developer.

In water and waste resource, Gentry and Fernande (1997) found the success factors to include:

- a widely recognised crisis to both public and private sectors
- the drive and commitment of a few individuals to make it happen
- a Government willing to accept the profit motive of private business
- the credibility of the champions and transparency of the process
- a flexible co-operative arrangements
- enough time taken for partnership development

Keene (1998) identified the four most important principles for successful public private joint ventures. They are to have the right objectives to carry out a business function; transfer title from government to the private partnership entity; substantial equity investment; and assure full alignment of interest between private and government partners.

It is possible based on the review of success factors for PPP that the internal success factors for construction PPP will include a flexible and innovative contract; a sound financial arrangement; shared liability and risk-taking; credibility and transparency; and mutual benefit objectives.

CONCLUSION AND RECOMMENDATION

Both the governments of developing and developed countries suffer from political and economic pressure to improve public sector facilities and infrastructure provision. The PPP started as a policy initiative to attract and encourage private sector participation in the provision of public goods and services. The benefits from the implementation of PPP are evident in a number of successful projects in both central and local government such as power provision, infrastructure, water and waste management, transportation, prisons, defence, housing, hospital, housing, and schools.

PPP for infrastructure provision can take many forms according to government sector's requirements. It ranges from the private sector's passive involvement of joint planning, management and operating contracts, more active "BOT" and concessions, equally joint ventures, to private sector leading lease-develop-operate contracts and full privatisation.

Fundamentally, the risks involved in construction PPPs can be grouped as development phase, operation phase and system risks. These risks can be further classified as design and construction risk, operation risk, demand/usage risks, residue risk, technology risks and regulation risks. A successful PPP is strongly depending on its external environment, such as the governors and legal requirements. Current review has suggested that the parties involved in PPP projects should insist on mutual benefit bases, devote enthusiasm and commitment to partnerships, and strongly share liability.

REFERENCES:

- Badshah, A. (1998) Good Governance for Environmental Sustainability. UNDP, <http://sdnhq.undp.org/pppue>.
- Bahl, R. W. and Linn J. F. (1992) *Urban Public Finance in Developing Countries*. Oxford Univ. Press, New York.
- Bennett R. J. and Krebs, G. (1991) *Local Economic Development Public-private Partnership Initiatives in Britain and Germany*. Belhaven Press, London.
- Brodie, M. J. (1995). Public/Private Joint Ventures. The Government as Partner – Bane or Benefit? *Real Estate Issues*, **20**(3): 33-42.
- Collin, S. O. (1998) In the Twilight Zone: A Survey of Public-Private Partnerships in Sweden, *Public Productivity and Management Review*, **21**(3) 272-283.
- Duffield, C. (1998) Commercial Viability of Private Financed Heating Systems in Europe – a Case Study, *Engineering, Construction and Architectural Management*, **5**(1) 3-8.
- Finnerty, J. D. (1996) *Project Financing: Asset-based Financial Engineering*. John Wiley & Sons, New York.
- Gallimore, P., Williams, W. and Woodard, D. (1997) Perceptions of Risk in the Private Finance Initiative, *MCB Journal of Property Finance*, **8**(2): 164-176.
- Geijniers, J. J. A. M. (1994) Organisation of Public-Private Partnership Projects – the Timely Prevention of Pitfalls. *International Journal of Project Management*, **12**(3): 137-142.
- Gentry, B. S. and Fernandez, L. O. (1997) Evolving Public-Private Partnerships: General Themes and Urban Water Examples. *Globalisation and the Environment: Perspectives from OECD and Dynamic Non-Member Economies*, 19-25, OECD, Paris.

- Gidman, P., Blore, I., Lorentzen, J. and Schuttennelt, P. (1997) Public-Private Partnerships in Urban Infrastructure Services. *UMP Working Paper Series 4, Nairobi: UNDP/Habitat/World Bank*, 12-36, <http://sdnhq.undp.org/pppue>.
- Gupta, J. P. and Sravat, A. K. (1998) Development and Project Financing of Private Power Projects in Developing Countries: a Case Study of India. *International Journal of Project Management*, **16**(2): 99-105.
- HM, (1995) *Private Opportunity, Public Benefit*. Private Finance Panel (PFP), HMSO, London.
- HM, (1998) *Better Quality Services: a Handbook on Creating Public/Private Partnerships through Market Testing and Contracting out*. HMSO, London.
- ICM Research, (1993) *Citizens Charter Customer Survey: A Research Report*. ICM Research, London.
- Jones, I., Zamani, H. and Reehal, R. (1996) *Financing Models for New Transport Infrastructure*. OOEPC, Luxembourg.
- Kanter, R. M. (1999) From Spare Change to Real Change. *Harvard Business Review*, **77**(3): 122-132.
- Keene, W. O. (1998) Reengineering Public-Private Partnerships through Shared-Interest Ventures. *The Financier*, **5**(2&3): 55-57.
- Lam, P. T. I. (1999) A Sectoral Review of Risks Associated with Major Infrastructure Projects. *International Journal of Project Management*, **17**(2): 77-87.
- Lu, Y. C., Wu, S., Chen, D. S. and Lin, Y. Y. (2000) BOT Projects in Taiwan: Financial Modeling Risk, Term Structure of Net Cash Flows, and Project at Risk Analysis. *Journal of Project Finance*, **5**(4): 53-63.
- Marcou, G. (1993) Public and Private Sectors in the Delivery of Public Infrastructure: the case of the Channel Tunnel from an international perspective. *Environment and Planning C: Government and Policy*, **11**: 1-18.
- Mustafa, A. (1999) Public-Private Partnership: An Alternative Institutional Model for Implementing the Private Finance Initiative in the Provision of Transport Infrastructure. *The Journal of Project Finance*, Summer, 64-79.
- Newman, P. and Verpraet, G. (1999) The Impact of Partnership on Urban Governance: Conclusions from Recent European Research. *Regional Studies*, **33**(5): 487-491.
- Ranasinghe, M. (1999) Private Sector Participation in Infrastructure Projects: A Methodology to Analyse Viability of BOT. *Construction Management and Economic*, **17**: 613-623.
- Roth, G. (1987) *The Private Provision of Public Services in Developing Countries*. Oxford University Press, New York.
- Stager, D. K. (1996) Organising and Managing a Finance-Design-Build Project in Turkey. Fourth Roebling Lecture, 1995A, ASCE *Journal of Construction Engineering and Management*, **122**(3): 199-204.
- Stonehouse, J. H., Hudson, A. R. Okeefe, M. J. (1996) Private-Public Partnerships: The Toronto Hospital Experience. *Canadian Business Review*, **23**(2): 17-21.
- Tiong, R. L. K. (1995a) Risks and Guarantees in BOT Tender. ASCE *Journal of Construction Engineering and Management*, **121**(2): 183-188.
- Tiong, R. L. K. (1995b) Impact of Financial Package versus Technical Solution in a BOT Tender. ASCE *Journal of Construction Engineering and Management*, **121**(3): 304-311.

Tony, G. (1996) Key to Successful Public-Private Partnerships. *Canadian Business Review*, **23**(3): 27-28.

Walsh, K. (1995) *Public Services and Market Mechanism: Competitive, Contracting and the New Public Management*. Basingstoke: Macmillan