
**Abstract**

Recent trends in the provision of infrastructure development indicate that the private sector is playing an increasingly important role in the procurement process. This trend has partly arisen out of a necessity for the development of infrastructure to be undertaken at a rate that maintains and allows growth. This has become a major challenge for many countries where it is evident that these provisions cannot be met by government alone. The emergence of Public-Private Sector Partnerships (PPPs), such as Build-Own-Operate-Transfer (BOOT) schemes, is a response to this challenge and provides a means for developing the infrastructure of a country without directly impacting upon the government’s budgetary constraints. This paper examines perceptions of BOOT schemes in order to develop a framework of critical success factors (CSF). Success factors are identified from relevant literature and a project specific CSF framework is produced with key issues discussed. Discussion focuses on a case study of a current Australian BOOT project, the Sydney SuperDome, which is proving to be an example of how both government and private industry is attempting to meet Australia’s need for infrastructure in the new millennium.

**Keywords**

BOOT, critical success factors, infrastructure, PPPs, Sydney SuperDome
Introduction

Angeles and Walker (2000) report that the future of construction over the next 10 years will be influenced by the restructuring and re-engineering of the procurement process. One way of meeting future procurement demands will be to develop better project delivery systems. A growing view is that new and innovative systems will continuously be used. These include the Build-Own-Operate-Transfer (BOOT) approach and recent alternatives such as Privately Financed Projects (PFP). This current trend for private sector participation in the provision of public infrastructure has partly arisen out of a necessity for the development of infrastructure to be undertaken at a rate that maintains and allows growth. This in turn has become a major challenge for many countries where infrastructure provision cannot be met by government alone. The BOOT approach is one current innovation in construction procurement and has been implemented both globally and within the Australian Construction Industry to provide a means for developing the infrastructure of a country without directly impacting on the government’s budgetary constraints. The rise in popularity is mentioned by McDermott (1999), who states that a significant development in construction procurement has been the rapid increase in the use of BOOT arrangements. This notion is further supported by Hardcastle et al (2005) who identify Public-Private Partnerships (PPPs) as being increasingly used to provide public facilities and services.

The Suez Canal experience demonstrated that the concept of private sector participation in infrastructure provision is not a new idea. However, BOOT concepts have become high on many government agendas in the last two decades. Duffield (2001) undertook a study of Australian PPP-style projects and identified that the majority of expenditure was for transport projects.
Jefferies and Chen (2004) provide Australian examples of the BOOT approach that include the Harbour Tunnel and Stadium Australia in Sydney, the M2, M4 and M5 tollways in New South Wales (NSW), and the Ord River Hydro-Electric Scheme in Western Australia (WA).

In Australia, the NSW State Government has an enviable reputation for working with the private sector in the provision of public infrastructure, particularly in relation to road, rail and Olympic infrastructure. A recent government publication ‘Working with Government: Guidelines for Privately Financed Projects’ attempts to capture this opportunity to increase the benefits and comment on the issues and concerns held by the private sector that may impede development (NSW Government, 2001). These guidelines draw on a similar initiative by the Victorian Government, ‘Partnerships Victoria’, which was produced with the intention of ensuring that the financial and efficiency benefits that private sector involvement can provide without compromising community needs (Victorian Government, 2001). This has helped to broaden relationships between the public and private sectors and lead to the formulation of new policies.

**Public Private Partnerships (PPPs)**

Akintoye et al (2003) define PPPs as a long-term contractual arrangement between a public sector agency and a private sector concern, whereby resources and risk are shared for the purpose of developing a public facility. The principal aim of a PPP for the public sector is to achieve value for money in the services provided while ensuring that the private sector entities meet their contractual obligations properly and efficiently (Grimsey & Lewis, 2002).

PPPs are a means of public sector procurement using private sector finance and best practice. PPPs can involve design, construction, financing, operation and maintenance of public
infrastructure and facilities, or the operation of services, to meet public needs. They are often privately financed and operated on the basis of revenues received for the delivery of the facility and/or services. One key to this is the ability of the private sector to provide more favourable long term financing options than may be available to a government entity and to secure the financing in a much quicker time frame (NCPPP, 2003). Such contracts are long-term in nature and typically 25-30yrs.

According to Mustafa (1999), PPPs address the common faults that are associated with public sector procurement such as high construction costs, construction overruns, operational inefficiencies, poor design and community dissatisfaction. The PPP is founded on transfer of risk from the public to the private sector under circumstances where the private sector is best placed to manage risk. One of the key features of the PPP which is appealing to the government is the shift of project risks from the public sector to the consortium involved with the project even though this requires a profit incentive to the project consortium (Grimsey & Lewis, 2002).

PPPs are being established as a cost effective method of overcoming costs associated with the provision and maintenance of infrastructure. Duffield (2005) identifies recent Australian examples of PPPs that include the New Prisons Project in Victoria, NSW Schools Project and Sydney’s Cross City Tunnel.

**The BOOT Concept**

Jones (2003) states that it is the contractual structure of a BOOT that forms the backbone of Australia’s PPP experience. The BOOT approach entails the project needs of the client (e.g. a building, road or similar facility) being met through an entity contracted to finance, design, build,
operate and own the facility for some period of time and then transfer it back to the client. During the period of ownership, the entity collects the revenue in order to repay the finance and investment costs, maintain and operate the facility and make a margin of profit (Chu, 1999).

The concept requires contracted parties to assume that risk lies with the party to whom is in most control. It is a strategy that is seen as embracing the notion of lifecycle cost effectiveness. This is an accepted proclamation as the entity proposing the design solution is responsible for maintaining and operating the facility. This therefore provides the incentive to reduce long-term costs and thus develop a highly cost-effective product (Walker and Hampson, 2003).

Most BOOT projects are first identified by the host government and in advertising or requesting for proposals, the host government asks for bids to have a particular project delivered on a BOOT basis (UNIDO 1996). Chege and Rwelamila (2001) state that the major difference between the financing of BOOT projects and the more conventional approaches is that lenders have only the project’s expected cashflows to indicate its economic viability. These projects are mainly funded through the technique known as ‘project finance’. Project finance helps new investment by structuring the finance around the projects own operating cashflow and assets, without additional sponsor guarantees. Further, the technique is able to alleviate investment risk and raise finance at a relatively low cost to the benefit of the sponsor and investor alike.

**Critical Success Factors**

The concept of ‘Critical Success Factors’ (CSF) was developed by Rockart and the Sloan School of Management with the phrase first used in the context of information systems and project
management (Rockart, 1982). Rowlinson (1999) states that critical success factors are those fundamental issues inherent in the project which must be maintained in order for teamworking to take place in an efficient and effective manner. They require day to day attention and operate throughout the life of the project.

A number of authors have identified factors they consider critical to the success of project procurement under BOOT, PPP or similar concepts. The following list attempts to summarise these:

- Developed legal and economic framework (Tiong, 1990)
- Favourable inflation, exchange and interest rates (Tiong, 1990)
- Financial capability and support (Tiong et al, 1992)
- Technical innovation (Tiong et al, 1992)
- Appropriate risk allocation (Grant, 1996)
- Avoiding delays and cost overruns (Tiong and Alum, 1997)
- Comprehensive feasibility study (Keong et al, 1997)
- Existing infrastructure (Keong et al, 1997)
- Political stability and support (Keong et al, 1997)
- A well prepared Environmental Impact Statement (Tiong and Alum, 1997)
- Expertise (Salzmann and Mohamed, 1999)
- Local partner(s) (Salzmann and Mohamed, 1999)
- Shared authority (Kanter, 1999)
- Transparency (Jefferies et al, 2002)
• Commitment (Hardcastle et al, 2005)
• Strong private consortium (Hardcastle et al, 2005)
• Developing a culture of partnership (Duffield, 2005)

Success within the context of a public-private sector joint venture may well mean different things to different stakeholders. The public and private sectors in BOOT projects will have some common goals but they will also have several project and long-term aims that are very different. Therefore, success in this paper is explored from different points of view. These view points are divided into the respective public and private sector participants within the case study project. CSF are vital for managers engaging in improvement of their organisation, as they will indicate how much progress is being made in particular areas (McCabe, 2001).

**Research Method**

A case study yields deep but narrow results (Fellows and Liu, 1997). The case study project in question will serve to test the validity of the CSF identified from the related literature, and the established framework acts as a sound foundation applicable to BOOT projects in general. Yin (1984) noted that the single case study method is an appropriate application where the case in question represents an extreme or unique case or that the situation has not previously been the subject of detailed scientific investigation. A single case study has been selected as the most appropriate means for the research reported in this paper. Collection of evidence for the case study was achieved by reviewing project documentation and an informal 3-stage semi-structured interview process with senior management from both the public and private sector stakeholders.
The research has identified CSF from the literature and the case study further validates these CSF in a generic ‘real world’ context.

**Project Background: Sydney SuperDome**

The SuperDome is located in the Western Suburbs of Sydney and was built as part of the 2000 Olympic Games infrastructure programme. It is a 70,000m2 multi-use indoor arena, was built at a cost of A$280 million over 25 months and has a 30 year operation concession period (Abi Group, 2001). Abigroup Ltd was awarded the project in July 1997 and the BOOT scheme was the second largest contract value awarded by the Olympic Co-ordination Authority (OCA). The design and construction of the Sydney SuperDome was completed by Abigroup in conjunction with Obayashi Corporation and the responsibility for the ongoing ownership is vested in the wholly owned Abigroup company, Millennium Ltd. A member of the Senior management team at Abi Group, describes the SuperDome as “...*the total event experience for Australia*”.

Construction of the arena was completed at the end of August 1999, and the arena has been operational since September 1999. The arena is able to seat up to 20,000 people and is able to be reconfigured very quickly using retractable seating. It is used for gymnastics, tennis, basketball, ice hockey and also for concerts and exhibitions. With 5-10,000 more seats than existing indoor venues in Australia, and the most modern facilities in the country, the arena aims to attract events not previously attracted to NSW.

**Project Finance**
The Olympic Co-ordination Authority (1999), states that the total estimated design, construction, fit-out, commissioning and financing cost of the Multi-Use Arena itself is A$197.2 million, of which the Government will contribute A$141,488,000 under the OCA's contracts with the private sector. The Millennium consortium will contribute approximately A$55.7 Million, of which:

- A$14.85 million is equity which, under the contract, was contributed on the date of practical completion of the pre-Olympics arena and carpark.
- Up to A$35.5 million was raised under an amortising debt finance facility provided by BankWest.
- Some or all of the balance will be derived from the arena's operating cash flows, with the arena's operating fund account being underwritten by Abigroup to the extent of A$5.3 million.

In addition, the Government will pay the Millennium consortium an estimated A$62.0 million for the planning, design, construction and commissioning of the adjacent Carpark and A$19.3 million for the adjacent ‘public domain’ landscaping and related works.

**Contractual Arrangements**

The core contract is the Multi-Use Arena Project Agreement between the OCA and Millennium Agent. This agreement permits and obliges Millennium Agent to:

- Finance, plan, design, construct and commission the Multi-Use Arena.
• Plan, design, construct and commission the adjacent Carpark and ‘public domain’ areas.

• Procure the operation, maintenance and repair of the Multi-Use Arena during the term of the lease from the OCA to Millennium Agent, in the form of the Land Lease annexed to the Multi-Use Arena Agreement to Lease, from the completion of the Multi-Use Arena and the carpark until 31 January 2031 or any earlier termination of the agreement.

• Make the Multi-Use Arena available to the Sydney Organising Committee of the Olympic Games (SOCOG) during the Games as set out in the Venue and the Commercial Rights Agreement.

• Yield up possession of the Multi-Use Arena to the OCA on 31 January 2031 or any earlier termination of the agreement.

Millennium Agent and Millennium Contractors contracted Obayashi, under the Multi-Use Arena Design and Construct (D&C) Head-Contract, to assume responsibility for their design, construction and commissioning obligations under the Project Agreement and OCA Works Design and Construction Deed. In turn, Obayashi has sub-contracted most of its obligations to Abigroup, under the Multi-Use Arena D&C Sub-Contract.

Under the Agreement to Lease between the OCA and Millennium Agent, the OCA has granted Millennium Agent and its contractors both the Access Rights to the arena construction site and the Land Lease, from practical completion until 31 January 2031 or any earlier termination date.

**Critical Success Factors Of The SuperDome Project**
Results and Discussion

The culmination of reviewing contract summaries, project documentation and the interview process with several key project personnel is evident in the following framework for critical success factors (Table 1) specific to the Sydney SuperDome project. The ‘crosses’ (X) in the following table identify which particular CSF is applicable to the relevant party managing the factor in question:

<table>
<thead>
<tr>
<th>Critical Success Factor</th>
<th>Consortium Party Managing The Critical Success Factor</th>
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<tr>
<td></td>
<td>Project Company</td>
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<tr>
<td>Approval Process</td>
<td>X</td>
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<tr>
<td>Negotiation</td>
<td>X</td>
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<tr>
<td>Client Brief/Outcomes</td>
<td>X</td>
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<tr>
<td>Bid Features</td>
<td>X</td>
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<tr>
<td>Business Diversification</td>
<td>X</td>
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<tr>
<td>Business Viability</td>
<td>X</td>
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<tr>
<td>Competition</td>
<td>X</td>
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<tr>
<td>Environmental Impact</td>
<td>X</td>
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<tr>
<td>Innovation/Complexity</td>
<td>X</td>
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<td>Political Stability/Support</td>
<td>X</td>
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<tr>
<td>Existing Alliances</td>
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<td>Organisational Resources</td>
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<tr>
<td>Trust</td>
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<tr>
<td>Community Support</td>
<td>X</td>
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<tr>
<td>Feasibility</td>
<td>X</td>
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<td>Credit Rating of Investors</td>
<td>X</td>
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<tr>
<td>Teamwork</td>
<td>X</td>
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<tr>
<td>Consortium Structure</td>
<td>X</td>
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<tr>
<td>Existing Infrastructure</td>
<td>X</td>
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<tr>
<td>Public Funding</td>
<td>X</td>
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<tr>
<td>Delivery of Asset</td>
<td>X</td>
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<tr>
<td>Investment Growth</td>
<td>X</td>
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<td>Project Identification</td>
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Table 1: Sydney SuperDome Critical Success Factor Framework
Approval and Negotiation Process

The SuperDome deal was a very streamline process. It came immediately after Stadium Australia (the Olympic Stadium project), and enabled reflection of the key issues associated on the stadium to be incorporated into the SuperDome. The various issues that had been sub-optimal on Stadium Australia, or at least where there was room for improvement, could actually be incorporated into the SuperDome process.

Clear Project Brief and Client Outcomes

Issues for project success are also linked to both producing a clear project brief and the experience of the client. In this case the Government was very educated and experienced in terms of both the end product and the BOOT process. The learning process of negotiating a similar BOOT project, Stadium Australia, a few months earlier, contributed to a successful negotiation process.

Increased Competition During the Tendering Process

The Government had its specific requirements and also knew its time frame, particularly with start of the Olympic Games in mind, and so they initiated the running of two groups to the very end of the tendering period, paying the losing bidder in the process. This differed dramatically from the one used to negotiate Stadium Australia as the successful tenderer had been identified at an early stage, with the remaining participants culled from the process, and contracts
subsequently signed. The SuperDome process took an entirely different approach by identifying two tenderers and negotiating with them until the very end of the tendering process. As the loser was offered a generous form of reimbursement for entering into the process, the running of the two tenderers as late as possible at the negotiation stage created a very competitive environment that could only offer the Government as good a deal as possible.

**Business Diversification**

The underlying key to success in any BOOT project is successful business operation. One area in which financial success can be further enhanced is that of business diversification. The SuperDome’s core business being a multi-use arena staging various sporting and entertainment events. In order to diversify and open up additional markets it also has a number of eating and drinking establishments that are also open on days when there are no events at the SuperDome. This may be particularly profitable on days when events are held elsewhere at Olympic Park, such as the nearby Aquatic Centre or Stadium Australia, and patrons need somewhere to park and eat. These indoor-outdoor aspects integrate the venue with the surrounding precinct and is a key success factor.

**Competition**

The SuperDome had no clever ideas, indeed, it appears that most BOOT projects don’t, but they are successfully driven by streamline financing and stakeholder equity. The Millennium Consortium bid was successful because it had streamline financing and reasonable equity in
participants who had more of a risk appetite than other bidders and actually wanted to enter this particular business. This appetite for risk also included wanting to compete with the nearby Sydney Entertainment Centre (SEC).

Only time will tell whether the appetite for competition with the SEC is wise or not and whether the business plan of the Millennium Consortium is sound enough to take on the competition. Initially, the business appeared to be struggling, but this is not uncommon in the current competitive climate. Ultimately, the Millennium bid was successful as it most closely matched the Government’s preferred risk profile.

Future Issues and Initiatives

One of Abi Group’s early strategies was to pursue relationships with events promoters and even develop expertise in events promotion themselves, in particular those events that are out of the ordinary when compared to other entertainment centres. Abi Group’s continued involvement in BOOT projects of this type appears unlikely. According to one of their Senior Managers:

“The SuperDome is probably a one-off project for Abi Group. The company intends to pursue infrastructure projects where the majority of the revenue stream is underwritten by Government, providing certainty in the business plan, and also roads and tollways as there is an almost guaranteed revenue stream”.
In summing up the future direction of private sector operators of public infrastructure, one of Abi Group’s senior management team stated that alliances in forthcoming PPPs are necessary for project success:

“Entry costs for major projects are becoming too heavy for one organisation to carry. Developing strategic alliances in future PPPs with other private sector operatives will be vital so that front-end costs can be shared in projects that are big enough to warrant these shared resources”.

Indeed, the role of government in these days of maximum risk transfer is highly significant with the current high bid preparation costs resulting in some private sector participants withdrawing from the PPP process. Lenard et al (2002) argue that private sector delivery of public facilities using private sector expertise can yield efficiency savings delivering better value for public money and that partnerships allow governments to reconcile capital investment by reducing capital expenditure items on balance sheets. Realistically, this can only be achieved if the rewards adequately reflect the amount of risk invested in the project.

**Conclusion**

The growing acceptance of alternative project delivery and finance methods for infrastructure provision involving public and private sector partnerships implies that governments will be increasingly faced with strategic choices whether to use ‘public’ or ‘private’ mechanisms, or a combination of the two. The principles embodied in PPPs are now established worldwide as a
significant means of developing public services without directly impacting on Government’s budgetary constraints.

Consideration given to BOOT characteristics and perceptions has allowed the development of a CSF framework which can be used to raise awareness of project issues at an early planning stage. The framework considers issues from all perspectives throughout the construction and development phase through to the operational and eventual transfer phase. The following critical success factors were identified which appeared to be the most significant up to the current early operational stage of the project life cycle:

- The issue of bidding risk was successfully managed by the Government in that they paid the loser after two tenderers were led to the latest tendering stage possible. This resulted in improvements in the quality of the two bids that were being prepared in direct competition with each other as the re-imbursement acted as a safety net for both tenderers leading to improvements in the process.
- The SuperDome project agreement was a very streamline approval and negotiation process. It came immediately after the contract stage of the Stadium Australia project which enabled the key issues from the stadium to be incorporated into the SuperDome. The various issues that had been sub-optimal on Stadium Australia could actually be incorporated into the SuperDome process.
- Success in any BOOT or PPP project is core business operation, in this case staging sport and entertainment events, but one area in which financial success can be further enhanced is that of business diversification. In order to establish additional markets the SuperDome has a
number of eating and drinking establishments that are also open on days when there are no events at the arena.

- The SuperDome had a streamline finance process with reasonable participant equity. The participants also had a risk appetite that exceeded the other tenderers and they wanted to develop the business. This appetite for risk extended into wanting to compete with a major rival venue, the nearby Sydney Entertainment Centre (SEC).

The SuperDome model appears to be setting the current benchmark for Australian BOOT projects and is acting as the framework for future PPPs initiated by the NSW Government. Time will tell whether the SuperDome works as a successful business, particularly with the competing venue of the nearby SEC, but recent figures do suggest that the SuperDome is achieving commercial success. The lease of the facility was transferred to Publishing and Broadcasting Ltd (PBL) in 2004 and generated over A$50 million in ticket revenue during 2005 ensuring that the SuperDome came second only to New York’s Madison Square Garden as the highest grossing arena in the world (The Australian, 2006). It has certainly delivered an outstanding building and is an example of how both government and private industry is attempting to meet Australia’s need for infrastructure in the new millennium.

As for the future of PPPs in Australia, more traditional economic infrastructure projects, such as roads, where there is a more defined revenue stream, appear to be successful. But, PPPs do not appear to be having similar success in social infrastructure projects such as hospitals and schools. Curnow et al (2005) identify that Governments continue to reduce the amount of private sector involvement in core activities, particularly during the operation stage, and subsequently, the
scope for the private sector participants to recover sufficient financial reward that offsets the high bidding costs is limited and has reached an unsustainable level.

References


