

BROADLEAF CAPITAL INTERNATIONAL PTY LTD

ABN 24 054 021 117

23 Bettowynnd Road
Pymble
NSW 2073
Australia

www.Broadleaf.com.au

Tel: +61 2 9488 8477
Mobile: +61 419 433 184
Fax: + 61 2 9488 9685
Cooper@Broadleaf.com.au

Specialists in Strategic and Project Risk Management

Broadleaf



Risk Management and PPP Projects

Dr Dale F Cooper
BROADLEAF CAPITAL INTERNATIONAL
www.Broadleaf.com.au

Australian Institute of Project Management, Showcase 2003
Perth, 29 August 2003

© Broadleaf Capital International Pty Ltd, 2003 - www.Broadleaf.com.au

This is an invited presentation made by Dr Dale Cooper, Director of Broadleaf Capital International, to the Western Australian Branch of the Australian Institute of Project Management at their Showcase conference held in Perth on 29 August 2003.

Broadleaf Risk management and PPP projects

© COPYRIGHT

This document contains substantial pre-existing intellectual property of value to Broadleaf Capital International Pty Ltd.

It is provided for information only but not to sell, licence or otherwise transfer it to any third party, whether in its original form or as part of any further development that the recipient might undertake, without Broadleaf's prior written agreement.

Dr Dale F Cooper
Director
Broadleaf Capital International Pty Ltd
ABN 24 054 021 117
Cooper@Broadleaf.com.au
Tel: +61 2 9488 8477

© Broadleaf Capital International Pty Ltd, 2003 - www.Broadleaf.com.au

2

Broadleaf Risk management and PPP projects

Summary

- Introduction to Public Private Partnerships
- Risk allocation in PPPs
- Project Cost Benchmark (PCB)
- Lessons and outstanding issues

© Broadleaf Capital International Pty Ltd, 2003 - www.Broadleaf.com.au

3

Broadleaf Risk management and PPP projects

Introduction to Public Private Partnerships

© Broadleaf Capital International Pty Ltd, 2003 - www.Broadleaf.com.au

4

Broadleaf Risk management and PPP projects

What is a Public Private Partnership?

The private sector invests in the assets, and may employ the workforce, to provide a service to or on behalf of Government

The service provider carries the risks and opportunities related to the means of delivery of the service

PPP aims to achieve better value for money over the life of a capability

© Broadleaf Capital International Pty Ltd, 2003 - www.Broadleaf.com.au 5

The focus of a PPP arrangement is on the provision of a service or a capability, not just an asset.

PPPs tend to be medium- or long-term contracts, including the provision of an asset and its through-life operation and maintenance.

Broadleaf Risk management and PPP projects

PPPs share risks between Government and the private sector

© Broadleaf Capital International Pty Ltd, 2003 - www.Broadleaf.com.au 6

There are a number of ways in which public sector services can be provided with the assistance of the private sector. They merge into one another as we move from left to right, and the private sector takes more risk as we move from left to right:

In an 'availability' model, the private sector provides an asset that is available for public sector use to an agreed standard and level of availability. A number of school and hospital projects are like this, where the private sector builds and maintains an asset and Government provides the expertise and equipment to deliver the service to the public.

Broadleaf Risk management and PPP projects

Examples of PPPs

Availability structures	Schools Hospitals Special Purpose Aircraft
BOO, BOT & BOOT structures	Car parks Toll roads Olympic Stadium Airport rail links
(Privatisations)	Power generators Airports Sea ports

© Broadleaf Capital International Pty Ltd, 2003 - www.Broadleaf.com.au 7

In a Build-Own-Operate-Transfer model (or one of its variants), the private sector provides all the assets and the services, with the assets reverting to the Government after the expiry of a concession period. Examples include toll roads, prisons, ports and airports. In the UK, some schools and training facilities have been provided on this basis, with the private sector delivering the basic education services as well as building and maintaining the assets.

Privatisation transfers the assets and the service delivery to the private sector, and Government sources all services from industry. Examples include vehicle fleets and power generators.

Broadleaf Risk management and PPP projects

PPP characteristics

- One or more private parties, fully accountable to Government for delivery of the specified services
- Clear and accountable risk allocation, with associated prices
- Clearly-specified outputs, with measurable KPIs
- Payments only on delivery of the specified services
- Relatively long-term commitments
- Ongoing value for money throughout the contract

© Broadleaf Capital International Pty Ltd, 2003 - www.Broadleaf.com.au 8

Arrangements like this introduce a range of risks. Detailed analysis is needed initially, far more than with traditional procurement, to examine:

- Functions, capabilities, outputs and KPIs;
- Costs and schedule;
- Risks and benefits, and their allocation.

This itself imposes time pressures, often severe.

There may also be third-party revenue involved, for example toll payments.

Broadleaf Risk management and PPP projects

Benefits

- More efficient risk allocation & management
- Single-point accountability
- Long term whole-of-life arrangements
- Incentive to innovate in capability delivery
- Payment profile may reduce capital 'hump'
- Engagement of industry in non-core functions

© Broadleaf Capital International Pty Ltd, 2003 - www.Broadleaf.com.au 9

The principle is that private sector processes and efficiencies are traded-off against a higher cost of capital, generating a net benefit for Government.

There may also be budgetary benefits for Government as the cash flow requirements are spread through time.

Broadleaf Risk management and PPP projects

Parties involved in a PPP

```

    graph TD
      GOV[Government] --- LO[Land owners]
      GOV --- FIN[Financier]
      GOV --- PRV[Provider]
      FIN --- EQ[Equity]
      FIN --- STD[Short-term debt]
      FIN --- LTD[Long-term debt]
      FIN --- CS[Credit support]
      PRV --- CON[Construction]
      PRV --- FM[Facilities management (Service provision)]
      PRV --- TP[Third-party users]
    
```

© Broadleaf Capital International Pty Ltd, 2003 - www.Broadleaf.com.au 10

PPPs usually involve a tripartite agreement between the Government, a service provider and a guarantor, commonly a financial consortium.

On the face of it, the arrangement looks risky, with many stakeholders. However, many of the individual parts are well known, and their risks can be managed. The integration issues are often complex.

Broadleaf Risk management and PPP projects

Risk Allocation in PPPs

© Broadleaf Capital International Pty Ltd, 2003 - www.Broadleaf.com.au 11

Broadleaf Risk management and PPP projects

Principles of risk allocation

Each risk should be allocated to the party best able to manage it at least cost

Not all risk need be transferred: inappropriate risk transfer incurs penalties and may create new risks

Worthwhile risk transfer requires flexibility in the contract: the party allocated the risk must be able to choose how to handle it

The partnership structure should take account of responsibility for managing risks

© Broadleaf Capital International Pty Ltd, 2003 - www.Broadleaf.com.au 12

Many of these principles are not specific to PPPs. They apply to most contractual relationships.

Broadleaf Risk management and PPP projects

Examples of typical risk allocations

Category	Risk	Gov't	Shared	Private
Location	Site selection	✓		
	Site conditions			✓
	Approvals		✓	
	Native title	✓		
	Cultural heritage	✓		
Design & construct	Design			✓
	Scope change	✓		
	Cost and schedule			✓
	Environmental			✓
	Commissioning			✓

© Broadleaf Capital International Pty Ltd, 2003 - www.Broadleaf.com.au 13

Broadleaf Risk management and PPP projects

Examples of typical risk allocations

Category	Risk	Gov't	Shared	Private
Operations & maint'ce	Input cost			✓
	Reliability and availability			✓
	Maintenance cost			✓
	Industrial relations			✓
	Physical security			✓
	Operator failure			✓
	Service scope change	✓		
	Service volumes		(✓)	✓
	Technical obsolescence		(✓)	✓
	Innovation (opportunity)			✓

© Broadleaf Capital International Pty Ltd, 2003 - www.Broadleaf.com.au 14

Service volume risks may be shared – for example, traffic or throughput guarantees may be provided.

Costs for major technical or system upgrades may be shared.

Risks may revert to Government if financing cannot be secured, for example if additional funds are needed for construction.

Government often wants a share of the refinancing benefit as short-term project finance is replaced by long-term bonds after practical completion and into the through-life phase. (The change in risk and the associated change in financing costs is sometimes seen as generating super-profits for the private sector provider.)

Broadleaf Risk management and PPP projects

Examples of typical risk allocations

Category	Risk	Gov't	Shared	Private
Financial	Interest rates pre-completion	✓		
	Sponsor fails to complete	✓		
	Financing shortfall	(✓)		✓
	Refinancing benefit		✓	
	Inflation		✓	
	Tax changes	(✓)		✓
Other	Changes in law		✓	
	Regulation			✓
	Force majeure		✓	
	Residual value	✓		

© Broadleaf Capital International Pty Ltd, 2003 - www.Broadleaf.com.au 15

Broadleaf Risk management and PPP projects

**Project Cost Benchmark (PCB)
or
Public Sector Comparator (PSC)**

© Broadleaf Capital International Pty Ltd, 2003 - www.Broadleaf.com.au 16

Broadleaf Risk management and PPP projects

The benchmark project

Project delivery by the Government, in the same way as it usually operates
Same service levels as the private sector
All material risks are valued and included
Competitive-neutrality adjustments (for in-house bids)
Total capital and through-life costs expressed as a Net Present Cost (NPC)

© Broadleaf Capital International Pty Ltd, 2003 - www.Broadleaf.com.au 17

Broadleaf Risk management and PPP projects

Components of the PCB

© Broadleaf Capital International Pty Ltd, 2003 - www.Broadleaf.com.au 18

The benchmark project is sometimes difficult to define.

The basis should be service delivery by the public sector operating in the same way it usually does, with responsibility and asset ownership being retained and a mixture of public and private sector entities carrying out operational tasks.

Service levels and material risks must be specified and costed.

Components:

- Transferable risk, ideally to be taken by the contractor;
- Retained risk, to be retained by the sponsor;
- Base cost, reliant on a good initial estimate.

All components are estimated as net present values.

The estimates are revised as the procurement proceeds:

- First, is PPP procurement better than direct purchase?
- Later, does a specific PPP offer good value for money?

Broadleaf Risk management and PPP projects

How do we account for risk?

- ✘ **Add a margin to the cost of capital**
How do we determine the appropriate margin?
Does it have an economic meaning?
- ✔ **Incorporate risk and uncertainty explicitly**
Identify potential changes in cash flows
Variations
Events
Positive and negative changes: opportunities as well as risks
Include project-specific risks in NPC models
Use simulation to generate ranges of outcomes

© Broadleaf Capital International Pty Ltd, 2003 - www.Broadleaf.com.au 19

Adding a margin to the cost of capital is not a preferred approach, as the PCB is based on Government delivery.

It is better to consider risks and uncertainties explicitly and model the associated variations.

Broadleaf Risk management and PPP projects

Quantitative risk analysis process

© Broadleaf Capital International Pty Ltd, 2003 - www.Broadleaf.com.au 20

This process can be applied to almost anything that can be represented in a spreadsheet model. Examples in which we have been involved include:

- Capital cost estimates;
- Operating revenue and expense estimates;
- Capital evaluation of minerals processing projects;
- Review of the budgets for the Sydney 2000 Olympic Games;
- Analysing the risk associated with an infrastructure investment and assessing a suitable price to place on a financial and operating guarantee.

The quantitative models are simple in principle, but they may be complex in practice. Steps include:

- Development of simple economic and financial cash flow models;
- Identification of risks and integration with the cash flow models, often at the level of cost elements.

Broadleaf Risk management and PPP projects

Simple economic evaluation model

© Broadleaf Capital International Pty Ltd, 2003 - www.Broadleaf.com.au 21

Broadleaf Risk management and PPP projects

Link the risk register to the quantitative risk model

© Broadleaf Capital International Pty Ltd, 2003 - www.Broadleaf.com.au 22

Broadleaf Risk management and PPP projects

Allocate risks to cost elements

© Broadleaf Capital International Pty Ltd, 2003 - www.broadleaf.com.au 23

Broadleaf Risk management and PPP projects

Quantify risks for each cost element

© Broadleaf Capital International Pty Ltd, 2003 - www.broadleaf.com.au 24

Broadleaf Risk management and PPP projects

Allocate risks to achieve the best price

© Broadleaf Capital International Pty Ltd, 2003 - www.broadleaf.com.au 25

Once risks have been identified individually, they can be allocated to optimise the price that must be paid. Risk for a portfolio is usually priced at the rate applicable to the most risky component – disaggregation generates lower prices for the portfolio as a whole by allocating risks and setting rates more efficiently.

Broadleaf Risk management and PPP projects

Quantify risks for each cost element, and include schedule risks

© Broadleaf Capital International Pty Ltd, 2003 - www.broadleaf.com.au 26

Schedule variations should also be included in the set of risks examined and priced.

Broadleaf Risk management and PPP projects

Price risks at a conservative percentile

© Broadleaf Capital International Pty Ltd, 2003 - www.broadleaf.com.au 27

The base cost for the PCB includes an allowance for risk. A policy decision is required to set the percentile at which risk is priced.

We have participated in one PPP where the 95-percentile was used, and in another where the 50-percentile was preferred. (Using the 50-percentile seems overly optimistic, while the 95-percentile might be a bit too conservative. It depends on the agency's appetite for risk.)

Broadleaf Risk management and PPP projects

Perform similar calculations for submitted tenders

- Identify general and tenderer-specific risks
- Review risk allocation
- Generate distributions of net present costs
- Adjust for risk transfer assumptions different from the benchmark project
- Adjust for competitive neutrality (if needed)

© Broadleaf Capital International Pty Ltd, 2003 - www.Broadleaf.com.au 28

The cost estimate should be at the same confidence level as for the PCB.

The competitive-neutrality adjustment is needed if there are Government in-house bids. The adjustment typically involves full costing of overheads and the inclusion of an appropriate commercial cost of capital, to ensure an in-house option is not given an unfair advantage.

Broadleaf Risk management and PPP projects

Compare bids with the PCB

© Broadleaf Capital International Pty Ltd, 2003 - www.Broadleaf.com.au 29

Note that contingencies are excluded, as they are incorporated implicitly in the cost distribution calculations

Broadleaf Risk management and PPP projects

Lessons and Outstanding Issues

© Broadleaf Capital International Pty Ltd, 2003 - www.Broadleaf.com.au 30

Broadleaf Risk management and PPP projects

Practical risk modelling: focus on high-risk areas

© Broadleaf Capital International Pty Ltd, 2003 - www.Broadleaf.com.au 31

Risk management often has a different focus from traditional management tools and techniques.

Risk management does not always require a mass of detail about the project or business activity (and for activities at the early concept or pre-feasibility stages there may not be much information anyway). It is often better to devote scarce management resources to examining risks more closely. For the risky areas, additional detail can be added as required.

Broadleaf Risk management and PPP projects

Lessons

Valuing risk transfer is not easy
Some risks may be better shared than transferred
It is very tempting to over-specify asset requirements instead of capability
Some projects are better suited to PPP than others

© Broadleaf Capital International Pty Ltd, 2003 - www.Broadleaf.com.au 32

Risks better shared: technology upgrades over a long-term agreement.

Over-specification of assets: Government often does this, as it is easier than specifying a capability!

Good projects for PPP: where it is relatively easy to specify service levels and the required performance – for example, roads and buildings.

There have been less-than-ideal outcomes in some projects recently: for example, New Southern Railway (Sydney Airport rail link), Melbourne metropolitan trains, Replacement Patrol Boats.

Broadleaf Risk management and PPP projects

Outstanding issues

What is the most appropriate confidence level for risk pricing?
How should flexibility be valued in a long-term contract?

© Broadleaf Capital International Pty Ltd, 2003 - www.Broadleaf.com.au 33

The setting of a suitable confidence level is often a political policy matter. This may be complicated by other matters – for example, for large contracts, an appropriate contingency in percentage terms may be equivalent to a large dollar amount, larger than is politically palatable if that large dollar amount might be used to delivery several smaller projects.

Long-term contracts restrict strategic options. It may be necessary to put a value on flexibility – for example by using real options, with the quantitative risk models discussed here as one of the major inputs.

About us:

Broadleaf Risk management and PPP projects

BROADLEAF CAPITAL INTERNATIONAL PTY LTD
ABN 24 054 021 117

Dr Dale F. Cooper
23 Bettowynnd Road, Pymble, NSW 2073, Australia

Tel: +61 2 9488 8477
Mob: +61 419 433 184
Fax: +61 2 9488 9685
Cooper@Broadleaf.com.au
www.Broadleaf.com.au

Dr Stephen Grey Grey@Broadleaf.com.au
Geoff Raymond Raymond@Broadleaf.com.au
Phil Walker Walker@Broadleaf.com.au

© Broadleaf Capital International Pty Ltd, 2003 - www.Broadleaf.com.au 35

Broadleaf provides a range of risk management services, including:

- Quantitative risk & financial modelling;
- Risk assessment for private financing options;
- Strategic & policy risk management;
- Development and implementation of organisational risk management processes;
- Project & procurement risk management;
- Risk assessment workshop facilitation;
- Risk management planning & treatment implementation;
- Operational reviews of risk management processes and procedures;
- Risk management training.

Please refer to our web site for more information, www.Broadleaf.com.au, or contact us at Cooper@Broadleaf.com.au if you have a specific matter you would like to discuss.