

# Sustainable Queensland

Volume 2

**Financing Infrastructure: Public vs Private**  
Stephen Gray

**Sustainable Queensland Infrastructure**  
Mark Ingham

**Private Capital Finance**  
Stephen Walsh, Ian Macoun et al.

SUPPORTED BY



## About this paper

**CEDA Information Paper 88**

**Title: Sustainable Queensland Vol 2**

ISSN 1832-8814

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The authors have been substantially assisted by the research and professional experience of the following staff – Jason Watters, Jenny Cosgrove, Nathan Lead, Ian Mitchell, Dr. Michael Regan, Dr. Richard Copp.

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## About CEDA

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# Foreword

CEDA is proud to present Volume 2 of our state-based research project Sustainable Queensland. The project critically analyses the phenomenal growth occurring in Queensland and the sustainability of that growth.

The first volume in the project examined the demographic changes underpinning Queensland's growth, and the insatiable appetite of Queensland industry for skilled workers. It generated significant discussion and captured the interest of the media.

Given the critical nature of the infrastructure issue, we expect an even greater response to this second volume. It tackles one of the most complex and controversial issues for Queensland's coming growth: the financing and management of the state's new wave of infrastructure construction.

As always, we are indebted to our authors – in this case, Mark Ingham, Professor Stephen Gray and the team at Wilson HTM led by Stephen Walsh and Ian Macoun. They will continue the discussion in our forward program of roundtables and trustee boardroom meetings. I would again like to acknowledge the contribution of CEDA state council member Professor Ken Wiltshire AO, JD Story Professor of Public Administration at the University of Queensland, in chairing the project, and the CEDA Queensland research committee which established the concept and defined the content of the entire study.

The Sustainable Queensland project has already had remarkable success in focusing trustees and the wider public on the issues surrounding Queensland's growth and the sustainability of that growth. Perhaps the most important message from this volume is that the citizens of Queensland hold their own future in their hands. If they hold their government and their private sector to high standards of accountability, Queensland will emerge an even better place to live and work.

I would like to acknowledge the financial assistance of GHD and Wilson HTM to this volume of our research project, and to thank them for supporting the launch.



Greg Meek

Sustainable Queensland Project Director, CEDA Deputy CEO and Executive Director for Queensland and the Northern Territory

# 1 Key Messages

Queensland faces a substantial infrastructure-building task extending for at least one decade and possibly more than two.

Stephen Walsh, Ian Macoun and the Wilson HTM team calculate that more than \$50 billion will likely be invested in Queensland infrastructure over the next 10 years. They point out that this will place stresses on the capacity of both the Queensland government and the state's construction industry. Government and private sectors will need to work together to ensure that Queensland's infrastructure needs are met in the most efficient way.

It is clear that Australia has large pools of private funds and private expertise to finance infrastructure. What needs to be resolved now is when private funds are better suited to the infrastructure finance task, and when public funding is more appropriate.

Walsh and Macoun note that private sector funding is becoming more competitive as PPP mechanisms become better understood, and suggest the time may be ripe to increase PPP activity in Queensland. If the right 'enabling environment' is created, they argue, both public and private sectors can benefit during the coming wave of infrastructure investment.

Professor Stephen Gray in his paper argues that there is no compelling case either that government borrowing is always to be preferred due to its low cost, or that public-private partnerships (PPPs) should always be preferred due to the private sector's ability to access and structure financing arrangements. The method by which new assets are financed will need to be chosen on a case-by-case basis. Professor Gray offers a framework for making these choices – a framework in which proper assessment of risk is the crucial ingredient.

Mark Ingham sets out what will be needed to manage the coming infrastructure investment wave in a way that does not compromise the needs of future generations of Queenslanders. The right management will include:

- proper evaluation of long-term impacts;
- prioritising investments on the basis of comprehensive financial, economic, social and environmental parameters;
- identifying key risks of projects;
- maximising competition in infrastructure delivery;
- minimising distortions in prices charged for infrastructure;
- using market mechanisms which take into account market failures; and
- creating a monitoring environment that focuses on key risks and key outcomes.

# 2 Financing Infrastructure: Public vs Private

BY STEPHEN GRAY

## Executive summary

The provision of adequate infrastructure is one of the key challenges currently facing policy-makers in Australia. A range of methods are available for financing, constructing and operating infrastructure assets. Traditionally, government has played a central role in the provision of infrastructure, but in more recent times there has been increased involvement of the private sector, especially via public-private partnerships (PPPs).

It has been argued that the involvement of the private sector can result in improvements in project design, efficiencies in construction and operations, and innovation in sourcing and structuring finance.

In this paper we focus on the financial aspects of the infrastructure procurement decision. In particular, we examine whether (and in what circumstances) private sector financing might be superior to government financing. Our conclusions are as follows:

- The relative merits of a PPP proposal can be assessed against traditional government procurement using the standard valuation framework that is applied in all other settings. This simply involves forecasting the expected cash flows and risk associated with each proposal and computing the present value of each alternative. This present value is a measure of the cost of the project in today's dollars, and alternative projects can then be ranked on this basis.
- In some jurisdictions the standard framework for assessing projects has been abandoned in favour of ad hoc approaches that by their own admission "have no direct meaning" (Partnerships Victoria 2003, p. 23). We demonstrate that the standard valuation framework works perfectly well. The problem is not with the framework itself, but with its misapplication by some decision-makers.
- A number of the proposed benefits of PPPs relate to improvements in the design, construction and operation of the infrastructure asset. We argue that such benefits can be separated from the financing

of the asset. That is, the benefits of private sector involvement in design, construction and operation do not necessarily require private sector financing. Proper design of contracts can separate financing choices from other aspects of the project.

- There are substantial funds available to finance the type of assets that might be the subject of a PPP. These funds are attracted by the nature of the assets being borrowed against, not the particular identity of the borrower. There is no external reason that government could not tap the same pool of funds to finance an infrastructure asset. If there is a political reluctance to borrow on the government's balance sheet, then it should be recognised that the use of private sector financing is the result of government policy rather than a proper financial assessment. Moreover, it is common for PPP proposals to incorporate innovative financial arrangements that include different tranches of debt, hybrid securities, refinancing arrangements, and so on. But there is no reason that government financing, arranged by a specialist agency such as Queensland Treasury Corporation, cannot replicate this.
- It is not the case that one form of financing is universally superior to the other. It is equally simplistic and wrong to argue that (a) the government cost of borrowing is lower so government financing should always be preferred, or (b) the private sector is more able to access and structure financing arrangements so PPPs should always be preferred. This assessment must be made on a case-by-case basis, using the framework we outline in this paper.

## Introduction

Infrastructure investment has important implications for long-term economic growth and prosperity. In south-east Queensland, strong population growth driven by interstate migration has increased the need for substantial infrastructure investment. The government's South East Queensland Infrastructure Plan and Program 2006–2026 estimates that around \$66 billion of infrastructure is required over the next 20 years.

Funding for this infrastructure can either be provided from the public sector (through borrowings or operating cash flows) or by the private sector (through purely private investment or via a public private partnership, or PPP). In this paper we examine the relative merits of government financing and financing from the private sector via a PPP and propose a framework for choosing between them.

Within this context, it is common for the following issues to be raised:

- Whether there are sufficient funds available to finance the particular project.
- Whether a PPP will incorporate more innovative design characteristics and involve better management of the construction and/or operating phases of the project.
- Whether government self-imposes a limit on debt financing.
- Whether the private sector is able to construct a more innovative, and cost effective, financing structure.
- Whether the risks that are transferred to the private sector under a PPP are really transferred, and how to quantify them.

Most Australian states address these issues in their evaluation of PPPs within some sort of value for money framework. Under this framework, a PPP is compared against a more traditional financing method. A number of potential benefits created by PPPs are often touted, including that:

- a whole-of-life approach to a project and appropriate risk sharing can improve the value for money achieved by the public sector; and
- the private sector is more efficient and innovative in designing, managing and utilising assets.

Our focus in this paper is on the *financing* choice – whether funds are raised by government or by the private sector. Consequently, we show how to separate the financing issues from other issues. The framework we develop for determining the best financing method is based squarely on the principle of value for money for taxpayers and on standard valuation practice, properly applied.

A sound and rigorous framework for assessing the relative merits of a PPP against public sector procurement is particularly important in Queensland, given its growing infrastructure needs. We argue that the current state of analysis in Australia is confusing and inadequate. We propose a

framework that involves (a) separating the investment and financing aspects of the proposals, and (b) properly applying standard valuation principles, rather than ad hoc “remedies”.

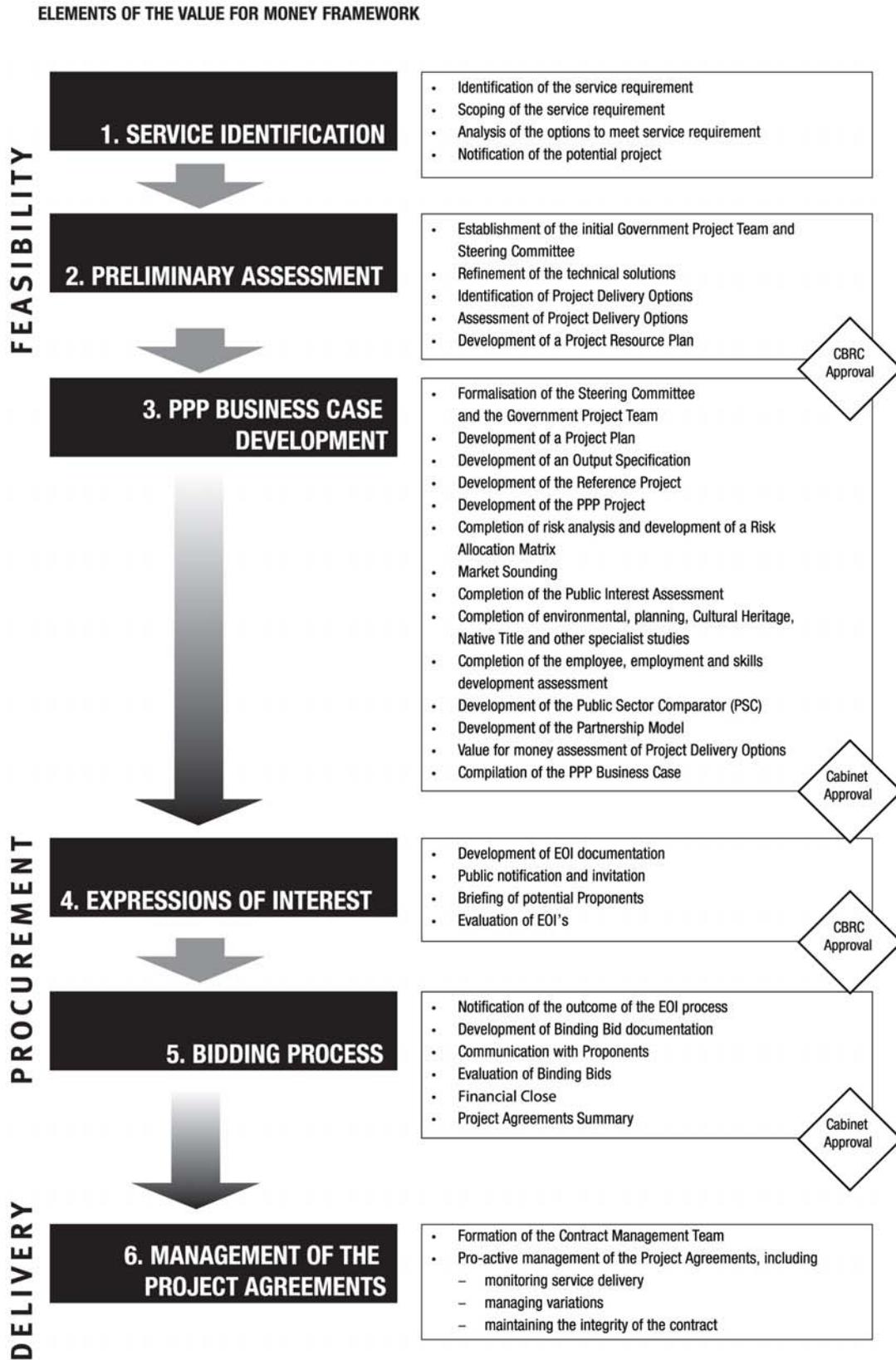
## Current value for money framework

The value for money framework outlines the approach used by government to evaluate a particular infrastructure requirement. The framework adopted in Queensland is outlined in Figure 1 (page 4). Other states generally adopt a similar framework.

There are six major stages in the value for money framework (Queensland Government 2002). In brief terms, these include:

- 1 **Service identification.** This stage requires the identification and broad scoping of a service requirement by a government agency.
- 2 **Preliminary assessment.** Here an assessment is made on the priority and affordability of the project and whether there is potential for a PPP to deliver value for money. This will require consideration of a number of factors, including the ability to transfer risk, the length of the project, the extent of potential private sector innovation and an assessment of whether any private sector interest would exist in the project. Preliminary financial and economic analysis is conducted within this stage to indicate the financial viability and economic benefits associated with each delivery option. At the end of this stage, the Cabinet Budget Review Committee (CBRC) will determine whether the PPP is likely to deliver value for money and further analysis is required in Stage 3. Otherwise, the project will proceed under traditional procurement methods (provided the project is considered a priority and affordable).
- 3 **PPP Business Case Development.** This stage expands on the feasibility analysis undertaken previously. The aim of the PPP business case development is to ascertain whether potential value for money exists through a PPP before taking the project to the private sector. A detailed financial evaluation of the scoped PPP project (the partnership model, which represents government’s best estimate of the delivery option that the private sector would likely adopt) is compared to more traditional delivery methods (the public sector comparator or PSC). To properly assess these two options, all material risks

FIGURE 1: VALUE FOR MONEY FRAMEWORK IN QUEENSLAND



SOURCE: QUEENSLAND GOVERNMENT, DEPARTMENT OF INFRASTRUCTURE.

must be identified and an assessment is required as to how these risks are allocated between the parties involved. At the end of this stage, Cabinet will determine whether a PPP is likely to deliver value for money, or whether a more traditional delivery method is preferred (again, provided the project is considered a priority and affordable).

- 4 **Expressions of interest.** Once Cabinet approves further analysis of a PPP option, the government will call for expressions of interest from the private sector. Based on these submissions, a shortlist of proponents will be determined based on an assessment of the parties' technical and financial capabilities. The shortlist requires approval from the CBRC.
- 5 **Bidding process.** Short-listed proponents are invited to submit binding bids. These bids are then evaluated against a number of criteria, which includes a comparison of the whole of life costs under the bid with the PSC. Following the evaluation of the bids, Cabinet will decide whether to proceed with the preferred PPP bidder, or to pursue a more traditional delivery method if the PPP project does not offer value for money relative to the PSC.
- 6 **Management of the project agreements.** Under this stage, the government must monitor the PPP to ensure that the private sector fulfils their obligations under the project agreement and, if required, manage any variations in the project agreement.

## Investment decision

When evaluating a proposed project, managers (whether in a government setting or in the private sector) are faced with two decisions: the investment decision and the financing decision. The investment decision is concerned with whether the proposed project should proceed. In a corporate setting this is determined in the context of the project's impact on shareholder value. In a government setting it is necessary to determine whether the project is beneficial to the state, broadly defined. In this section we examine the investment decision, while the following sections focus on the financing decision; having determined to proceed with the evaluation of the project, we need to determine the best way to finance it.

### Cost-benefit analysis

In a government setting the investment decision can be considered within a standard cost-benefit framework. The decision-maker seeks to determine

whether the benefits of the project outweigh the costs. The outcome is a determination of whether the project will provide a net benefit to the state.

This type of analysis compares the total benefits associated with a project with its total costs. Importantly, cost-benefit analysis attempts to measure the value of *all* costs and benefits associated with the project – not just *financial* costs. For example, a new toll-free bridge may benefit the state even though it produces no revenues. These benefits may include reduced travel time, reduced congestion on alternative routes and reduced accidents and fatalities. Estimating the magnitude of the benefits and costs is difficult but essential to properly determine whether a project is beneficial to the state.

In reality, of course, the attempt to properly measure the full costs and benefits of a project might be performed with different degrees of diligence. Indeed, the decision to proceed with a particular project may even be influenced by factors other than the costs and benefits to the whole state. In any event, the process by which government determines that a particular project should proceed to the next stage of evaluation is beyond the scope of this paper. Our focus is on the financing of a project – given that the project is to proceed to the next stage of evaluation, what is the optimal way of financing it? We will assume that this first hurdle has been cleared and the government is seeking to assess the optimal method of financing the project.

## Methodology to value financial aspects of PPPs and PSCs

Once the investment decision has been made, the appropriate method of financing must be determined and this is referred to as the *financing* decision. The financing decision requires a comparison of the net present value of the PSC and the net present value of the PPP.

### General framework

Suppose that the government has decided to proceed with the development of a new toll bridge. This decision is based on the premise that the bridge will provide a net benefit to the state. The government now has to determine whether to develop this toll bridge via public sector procurement or a PPP. In making this choice, government will seek to minimise the net cost or maximise the net benefit, as the case may be. In most cases the project will involve a net cost.

For projects that offer a net financial benefit (where the future revenue stream more than offsets the costs), there is no need for the government to be involved – this would be an attractive project for a private sector operator to develop, quite independently of government. For example, constructing and operating an airport or an electricity generator does not require any financial involvement from government. Consequently, projects are considered here that involve a net cost – some form of government subsidy is involved. Presumably the government has assessed that the amount of the financial subsidy from government is more than offset by the (difficult to quantify) social benefits of the project. In this case, the financing decision involves minimising the net cost of providing the project.

## General valuation methodology

In corporate finance practice the general approach to evaluating two competing projects is to examine the net present value (NPV) of each and undertake the project with the highest NPV. The NPV of a project can be computed by discounting future *expected* cash flows ( $CF_t$ ), as follows:

$$NPV = \sum_{t=0}^n \frac{CF_t}{(1+r)^t}$$

In this setting  $r$  is the risk-adjusted discount rate. It represents the return required by investors to undertake projects of the given risk level. This return is required to compensate investors for the time value of money and the relevant amount of risk involved in the project.

If the present value of cash outflows (e.g., construction and operating costs) exceeds the present value of cash inflows (e.g. sales revenues), the NPV will be negative. In this case, standard corporate finance principles would suggest that the project be rejected. However, in a government setting the project may proceed if the government assesses the social benefits to outweigh the financial cost. Such cases are referred to as *net cost projects*.

The objective of government in these cases is to minimise the net cost of providing the project. Importantly, we need to assess the net cost *to government*. This involves finding the present value of the cash flows made and received by government.

In our view, the fact that the stock-standard valuation framework can be applied to a properly defined series of cash flows and a corresponding

discount rate should all be seen as uncontroversial. However, there are at least two important and common misconceptions that arise in the evaluation of PPPs.

### **Misconception 1: The discount rate for publicly financed projects is lower than for privately financed projects because the government can borrow funds more cheaply.**

Here the argument is that the government's borrowing rate is lower than that of the private sector, so government financing should be preferred, other things being equal. This, of course, is simplistic and wrong. The discount rate to be used in the standard valuation framework is one that is appropriate, given the risks of the project itself. The appropriate discount rate is related to the project and not to the particular circumstances of the borrower at the time.

The government borrowing rate is lower because the government has the ability to tax current and future generations to provide a guarantee of repayment to lenders. Taxpayers have provided a valuable guarantee that reduces the government's cost of borrowing. But the private sector can do exactly the same thing, via the process of credit wrapping. A BBB-rated firm can pay essentially a guarantee fee to a AAA-rated financial institution to guarantee repayment of its debt. This reduces the firm's cost of borrowing.

If a PPP is to be adopted, taxpayers must effectively pay the guarantee fee (as it is built into the cost base of the PPP), but they receive a benefit in the sense that it is now the financial institution, rather than taxpayers themselves, that is providing the guarantee. It would clearly be wrong to include the cost of the guarantee fee, but to ignore its benefit when assessing the PPP. Yet this is exactly what is done when it is simplistically argued that the government cost of borrowing is lower than that of the private sector.

To summarise, there are at least three options available in relation to this issue:

- the project can be financed by government, in which case taxpayers are providing the guarantee;
- the project can be financed by a PPP with a credit wrap in place, in which case the cost of the guarantee is included in the PPP cost base; and
- the project can be financed by a PPP with no guarantee, in which case a higher rate is included in the PPP cost base.

It is impossible to conclude that one of these options is always superior to the others in all circumstances. Each case must be assessed on its merits.

In practice, there is broad agreement that the appropriate approach is to discount cash flows at a rate commensurate with the risk of those cash flows – one should not discount PSC cash flows at a rate that asymmetrically ignores the loan guarantees effectively provided by taxpayers.<sup>1</sup>

In summary, the appropriate approach is that any series of expected cash flows should be discounted at a rate commensurate with the risk of those cash flows. This suggests that the standard valuation approach can be implemented in the standard way, even when comparing PPPs against the PSC.

Finally, if we were to simplistically consider the government cost of funds for a project to be lower than the private sector cost of funds for the same project, the logical conclusion is that the government should own all projects. Not just infrastructure projects, but *all* assets in the economy – and this is clearly ridiculous.

## **Misconception 2: For net present cost projects, risk-adjusted discount rates are theoretically flawed.**

Under the standard valuation framework, all future expected cash flows are discounted to their NPV at a rate that reflects the risk of those cash flows. The project with the highest NPV is preferred. However, it is sometimes suggested that this standard NPV methodology is inappropriate for government projects that have a negative NPV (net cost projects).

As unlikely as it seems that the standard valuation approach would work perfectly well in all circumstances other than assessing Australian PPPs, this view has permeated the way in which PPPs are assessed.

The reasoning behind this view is that for net cost projects standard valuation techniques would seem to favour higher risk. That is, when net cash flows are negative, more risk would mean a higher discount rate and a lower net present cost. It seems counter-intuitive that we would be made better off by accepting more risk. When deciding between two mutually exclusive projects with similar cash flows but varying risk it would seem reasonable that the government would desire the less risky project. However, when discounting a regular stream of cash outflows, a higher discount rate (according to the capital asset pricing model, or CAPM) will result in

the more risky project being accepted, which is often considered counter-intuitive.

This perceived flaw of the NPV methodology has led to the development of other techniques to value risky cash outflows when comparing PPPs with the PSC. Many of these are ad hoc and inconsistent with both finance theory and standard valuation practice.

For example, Partnerships Victoria (2003, p. 23) comments that:

*By using the standard methodology to calculate discount rates for net cash outflow projects, other things equal, a more risky net cash outflow would be assigned a higher discount rate, resulting in a lower net present cost (NPC). This would make the higher risk project appear more preferable to a lower risk project, whereas a rational party would prefer the lower risk project.*

To overcome this issue, they propose a modified CAPM for net cash outflow projects, such that:

*This modified approach will provide the correct rankings for different cash flow alternatives faced by government. However, the actual, absolute NPCs derived will have no direct meaning.*

Under this modified CAPM approach, Partnerships Victoria use the risk-free rate to discount net cash outflow projects for the PSC, and a rate between the risk-free rate and the project rate for PPPs (depending on the level of risk transfer between the parties). NSW Treasury also utilises a different discount rate for net revenue and net cost projects.

Moreover, Partnerships Victoria is quite clear that the result of their ad hoc “remedy” is output that has no meaning. The present values obtained using the proposed approach cannot be interpreted, but it is argued that the approach will provide the correct ranking among projects. It seems unlikely that the standard valuation approach works in every setting other than this. It is even more unlikely that an approach that produces a series of valuations, each of which is individually meaningless, will nevertheless produce the correct ranking among a set of alternatives.

In the following section we demonstrate that the standard valuation approach, if applied properly, works just as well in the PPP setting as in any other setting. The recommended approach is to:

- Assess the expected cash flows from each alternative;

- Quantify the relevant risk involved in those cash flows;
- Discount those cash flows back to present value in a way that properly accounts for their risk; then
- Select the option with the superior net present value.

## Measuring risk and incorporating risk adjustments<sup>2</sup>

### Context

When comparing a PPP proposal against the public sector comparator (PSC), it is important to properly understand the concept of risk and how to take account of risk when discounting cash flows to their present value. This is because the PPP and PSC alternatives will often differ in terms of the level and the risk of the cash flows. Under the PSC, government bears all of the risk of the project, but under a PPP the risk may be shared with the private sector. Therefore, the ability to properly measure risk and to properly risk-adjust the cash flows is crucial.

### Types of risk

To appropriately value the PSC substantial consideration must be given to risk. Modern portfolio theory considers two types of risk – diversifiable and systematic risk. Diversifiable risk refers to events (both positive and negative) that may affect an individual firm. For example, the CEO may unexpectedly resign, an explosion may occur at a major pumping station, the firm may win a lucrative contract or discover a large ore deposit. These risks apply to an individual firm and do not affect the broad stock market. They are known as diversifiable risks because they can be effectively eliminated if an investor holds a diversified portfolio of assets, rather than a single investment.<sup>3</sup>

Systematic risk refers to events that have an impact (positive or negative) on the broad market and so cannot be eliminated, even in a broadly diversified portfolio. For example, the Reserve Bank may increase or decrease interest rates, oil prices may rise or fall unexpectedly, or the federal government may announce details of a significant tax reform package. Because it has an impact on the broad market, systematic risk is also known as market risk. Since this risk cannot be easily diversified away, investors will require a return premium to compensate them for bearing it.<sup>4</sup> Thus, systematic risk depends on the relationship between the returns of a particular investment and those of a broad market index (such as the All Ordinaries Index or ASX 200 Index).

In project valuation, both *systematic* and *diversifiable risks* must be properly accounted for. First, we need to construct a series of expected cash flows for each option. To derive expected cash flows, all potential outcomes and their probability of occurrence are considered. Expected cash flows are subsequently a probably-weighted average of all the potential outcomes. It is important to note that we do not want *most likely* cash flows (the cash flows from the most likely scenario) but *expected* cash flows.

When these cash flows are discounted to present value, the risk-adjustment is in terms of systematic risk only. Under the standard valuation framework used in practice, investors only require compensation for bearing *systematic risk*. This is because diversifiable risk can be easily eliminated by the investor simply holding a diversified portfolio, so there is no return premium for bearing a risk that could be easily eliminated.

### Risk-adjustments

When computing the present value of a series of cash flows, there are two ways to adjust for systematic risk. Consider a risky expected cash flow to be received at time  $t$ . We can make a risk adjustment to the cash flow or to the discount rate when computing the present value. Both of these standard textbook approaches are perfectly equivalent and produce identical results.

All we are saying here is that investors dislike risk, and that there are two ways of thinking about this – investors will pay to avoid risk (this is the cash flow adjustment) or they will require higher expected returns on more risky investments (this is the return adjustment).<sup>5</sup>

The cash flow risk adjustment is as follows:

$$\begin{aligned}
 PV &= \frac{CF_t - \left[ \begin{array}{l} \text{Cash flow} \\ \text{risk adjustment} \end{array} \right]}{(1 + r_f)^t} \\
 &= \frac{CEQ_t}{(1 + r_f)^t}
 \end{aligned}$$

The numerator here is known as the *certainty equivalent* cash flow. It is a certain, non-risky cash flow that has the same value to investors as the risky cash flow. For example, investors might be indifferent between a cash flow with an expected value of \$100, but with positive systematic risk, and a certain cash flow of \$95. This certainty equivalent

cash flow is then discounted back to present value using a risk-free discount rate (usually proxied by the yield on government bonds).

The alternative, but perfectly equivalent approach is to apply the risk adjustment to the discount rate as follows:

$$PV = \frac{CF_t}{\left(1 + r_f + \left[ \begin{array}{c} \text{Return} \\ \text{risk adjustment} \end{array} \right] \right)^t} \\ = \frac{CF_t}{(1 + r)^t}$$

In this case, we have a risky cash flow in the numerator, so we need a risk-adjusted discount rate in the denominator.

It is this second approach that is more commonly used when assessing PPPs. This is done via an economic model known as the Capital Asset Pricing Model (CAPM). Under the CAPM, the return risk adjustment referred to above takes the following form:

$$\left[ \begin{array}{c} \text{Return} \\ \text{risk adjustment} \end{array} \right] = \beta \times MRP$$

where  $\beta$  is a measure of the systematic risk of a particular project, and  $MRP$  (or market risk premium) is a measure of the additional return that investors require for bearing each unit of systematic risk. The average investment in the market has a beta of 1. Investments that tend to generate very high returns when the market is up and very low returns when the market is down have betas greater than 1, and investments that are much less sensitive to market movements tend to have betas less than 1.

It is standard practice to estimate the beta from data from comparable listed firms. Suppose, for example, that we are evaluating a toll road project. It would be standard to estimate the beta by first compiling a set of comparable listed firms (toll road operators and possibly other infrastructure firms) and then examine the extent to which the returns of those firms vary with market movements. If the returns of listed firms are highly sensitive to market movements we will estimate the beta to be more than 1, and so on.

We show in the following section that it is the misapplication of this step that is the source of confusion and error in evaluating PPPs.

## Application to net cost projects

In *Valuing Public Private Partnerships* (SFG, 2006), we developed a detailed example to show the equivalence of these approaches, even for a net cost project. In this example  $r_f = 6\%$ , the project generates a single cash flow, and there are two states. In the first, the economy is booming, the market is up, and the cash flow is 80. In the second, the economy is in recession, the market is down, and the cash flow is 100. Each state is equally likely, so the expected cash flow is 90. This might be the case, for example, where government is operating a toll bridge that is not economically viable. Such a project may have been justified on the basis of the social benefits it brings. In this case, the expected cash *outflow* is 90, since toll revenues are insufficient to cover all costs. But if the economy is doing well, traffic volumes might be higher and it might be possible to increase prices – so more revenue is collected and the net cash outflow is only 80. Symmetrically, if the economy is not doing so well, revenues are lower and the net cash outlay is 100.

This cash flow has positive systematic risk because it is better than expected when the market is up and worse than expected when the market is down. Standard finance principles suggest that investors dislike this systematic risk and would pay to avoid it. Our earlier paper, *Valuing Public Private Partnerships* (SFG, 2006) shows that they would pay 2.43 to remove the risk from these cash flows, so we have:

$$PV = \frac{CF - \left[ \begin{array}{c} \text{Cash flow} \\ \text{risk adjustment} \end{array} \right]}{(1 + r_f)} = \frac{-90 - 2.43}{(1.06)} = -87.2$$

That is, the appropriate risk-adjusted present value of this expected cash outflow is  $-87.2$ .

Now consider the calculation using a returns adjustment. Standard practice would be to examine a set of comparable listed firms to estimate the systematic risk (or beta) of toll road investments. When we do this, we'll notice that the returns of comparable firms tend to go up a little when the market is up and down a little when the market is down, and we might conclude that an appropriate return for this level of risk is 9 per cent. But if we apply this to our expected cash outflow, we get an inconsistent result:

$$PV = \frac{CF_t}{(1 + r)^t} = \frac{-90}{(1.09)^1} = -82.6$$

Moreover, if the risk associated with this cash flow were even higher, the risk-adjusted discount rate would be greater, and the present value would be lower – which would seem to make us better off. This counter-intuitive result has led some state governments to abandon the standard valuation framework in favour of ad hoc approaches. However, this puzzling result is not due to the standard economic framework itself, but rather comes from its misapplication by decision-makers. In particular, the problem is that listed comparable firms all have a positive value whereas the government project being evaluated has a negative present value. Consequently, they are not at all comparable and to treat them as such is highly misleading.

To see this, recall that toll road investments tend to do a bit better than expected when the market is up, and a bit worse than expected when the market is down. This led to our set of comparable listed firms tending to have positive returns when the market is up and negative returns when the market is down.

But now consider how the returns behave for a net cost (government) project. First, we compute what the return would be in each state. The initial value is –87.2. If the first (up) state occurs, the return (computed as change in value divided by initial value) would be:

$$r = \frac{(-80) - (-87.2)}{(-87.2)} = -8.3\%$$

and if the second (down) state occurs, the return would be:

$$r = \frac{(-100) - (-87.2)}{(-87.2)} = 14.6\%$$

That is, we have a negative *return* when the market is up and a positive *return* when the market is down. This is very different from the set of listed firms – and implies that they are not at all comparable.

In our earlier paper, we show that the appropriate discount rate to be applied to this net cost project is 3.2 per cent, so we have:

$$PV = \frac{CF_t}{(1+r)^t} = \frac{-90}{(1.032)^1} = -87.2$$

which is perfectly consistent with the cash flow adjustment above.

## Summary

In this section, we established that the standard valuation framework requires future cash flows to be discounted back to their equivalent present values. The way this standard framework has been applied by some government agencies and advisors leads to counter-intuitive results in some circumstances. This applies particularly to net cost projects – those with negative present values, a common feature of government-initiated projects. In this case, increasing the risk of the cash flows would appear to *decrease* the present value of the cost, making government better off.

Since this cannot be reconciled with commonsense, the standard valuation framework has been abandoned in favour of ad hoc alternatives. These alternatives produce net present values that have no interpretation, but others have argued that the approach can be used to rank among alternative projects. We argue that such “remedies” are misleading and unnecessary.

Moreover, we demonstrate that the standard valuation framework works perfectly well. The problem is not with the framework itself, but with its misapplication. The source of the problem is in treating a set of listed firms as comparables, when they are not at all comparable. To determine the present value of a net cost project we would need a set of comparable firms with negative values, but this, of course, is impossible. Consequently, we recommend making a risk adjustment to the cash flow estimates for the project. In *Valuing Public Private Partnerships* (SFC 2006), we showed that the data required to implement this approach is already collected as part of the project evaluation exercise for Queensland government projects.

## Comparing PPP proposals against the PSC

### Context

Once government has determined that a particular project is likely to provide a net benefit (however defined) to the state it may invite PPP proposals from the private sector. What is then required is a framework for evaluating the PPP proposals and the PSC against each other.

We argued in the previous section that this can be done within the standard valuation framework, properly applied. For each option, we need to assess the expected cash flows and the risk of those cash

flows. We then apply a risk adjustment to the cash flows and compute a present value. This then serves as a basis for comparison of the alternatives. In all cases, we are concerned with the cash flows *to government* (i.e. what government will pay or receive) and the risk of those cash flows *to government*.

The difference between PPP proposals and the PSC is that (a) the expected cash flows may differ or (b) the risk of those cash flows may differ. In this section we will examine the source of these differences and ask whether a full PPP is required to extract the benefits of private sector involvement. In particular, the focus of this paper is on *financing* options. Financing is only one of a range of potential benefits that come from private sector involvement, so we try to separate out other non-financing aspects of a PPP.

## Sources of differences between PPP and PSC

The application of the standard valuation framework outlined above can produce different NPVs for the PPP and PSC alternatives. There are a number of reasons PPP and PSC alternatives may yield different net present values. Essentially these relate to the cash flows, the discount rate, or both differing between the PPP and PSC alternatives. Some examples of the potential differences are as follows:

- **Private sector innovation.** It is often argued that the private sector may be able to improve the financial position of the project via innovation in the design or management of the project. For example, a PPP proposal might involve a modification of the project design that increases revenues – an additional on-ramp at a key intersection might increase the volume that passes over a toll bridge. This would result in cash inflows being higher under the private sector bid.
- **Private sector management.** It is often argued that the private sector is more proficient at managing the construction phase of a project, with statistics being cited that compare delays and cost over-runs in projects managed by government with private sector projects. In addition, the private sector proposal might involve more flexible working arrangements for staff that improve productivity and reduce costs. This would result in cash outflows being lower under the private sector bid.
- **Risk transfer.** Under the PSC, government bears the entire risk associated with the project. Under the PPP, the private sector partner may bear some

or all of the project's risk. Thus, the risk of the cash flows to government may differ under the two alternatives. In this case, different discount rates or risk adjustments would be appropriate.

In summary, there are reasons why the cash flows to government and the discount rate to be applied to them may differ between PPP and PSC alternatives. But having properly specified cash flows and the associated discount rate, standard valuation tools can be applied to determine the net present value.

## Capturing private sector benefits without a PPP

When comparing just the potential financing benefits of a PPP against the PSC, it is important to be able to separate out other differences. In fact, most of the other proposed benefits of private sector involvement can be separated from the form of financing.

### DESIGN INNOVATION

It is relatively straightforward to capture private sector innovation without a full PPP arrangement. As part of the PPP bidding process the bidders provide full details of the proposed specifications of the project. This might include an additional on-ramp for a toll bridge, a higher number of beds or an attached out-patient facility at a hospital, and so on. Thus, the project itself may differ under the PPP proposal compared to the PSC. This confuses the comparison of the *financing* options open to government. It is possible, for example, that the optimal solution might be to adopt the PPP project design, but to have it financed by government debt.

That is, we would ideally be able to separate out the design and financing aspects of the project and to select the best option in relation to each – rather than just the best bundle. This, of course, presents issues to the potential private sector bidders who may be reluctant to bid if their ideas are simply to be “stolen” by government to improve the design of the project. But there are mechanisms for handling such issues. For example, bidders might be compensated for reasonable costs in preparing the bid if government decides not to proceed with a PPP. Moreover, for larger projects it is likely that only a few consortiums would prepare bids so each could negotiate a price with government for preparing a full bid. It is not the case that the only way to benefit from private sector innovation is to also adopt private sector financing.

## CONSTRUCTION MANAGEMENT

A similar point applies in relation to construction management. It is not necessary to adopt private sector financing in order to obtain any benefit that might come from private sector construction management. Even with government financing it is possible to negotiate a fixed price contract, penalty clauses, and so on with a private sector construction firm.

Moreover, better information can be obtained by separating the components of a tender. Rather than have a single bundled PPP proposal it is beneficial (from an information perspective) to obtain separate quotes on design, construction, operations, and so on. A range of fixed-price bids for the construction of the project provides a market test of the construction cost. The construction cost in the PSC is often a (noisy) government estimate.

## PROJECT MANAGEMENT

It is also unnecessary to adopt private sector financing in order to obtain any benefit that might come from having a private sector operator who is able, for example, to improve productivity by introducing more flexible financing arrangements. One approach is for government to simply sell the rights to operate the toll road or hospital to a private sector operator for a fixed price (or to pay the private sector a fixed price, as the case may be). This can be separated from the financing of the project.

In addition, *alliance contracts* are becoming a favourable mechanism for delivering infrastructure. Alliance contracts are:

*Incentive based relationship contracts in which the parties agree to work together as one integrated team in a relationship that is based on the principles of equity trust, respect, openness, no dispute and no blame. In alliances all parties are bound to a risk/reward scheme where they all share savings or losses, depending on the success or otherwise of the project* (Henneveld 2006, p. 4).

Alternatively, an

*alliance is an agreement to share both the benefits and the risks associated with project delivery according to a pre-agreed pricing formula. It is typically characterised by no fixed cost, a sharing of all risk and responsibility, and the use of a financial risk-sharing mechanism.*

*Under the financial risk-sharing mechanism, the owner of the project will meet all of the costs of the project. Recovery of profit, and the sharing of any savings, is*

*determined by the pricing formula which is part of the risk-sharing mechanism. Consistent with the sharing of risk and responsibility, parties under the alliance cannot bring legal proceedings against one another* (Infrastructure Partnerships Australia 2007, pp. 38–9).

An alliance arrangement has been proposed as part of the South East Queensland Infrastructure Plan and Program (SEQIPP) for the upgrade and maintenance of Queensland Rail.

At a more general level, Brealey, Cooper and Habib (1997) focus on the agency cost problem, whereby managers fail to act in the interests of the investment owners. They suggest that private sector can produce more efficiently due to a superior ability to handle agency problems relative to the public sector. As governments are elected by voters, who have varying tastes and preferences, the public sector must trade-off the benefits of efficiency while maintaining equity. Brealey et al. comment that “the disparate objectives of voters augment the discretion of governments and further their scope [the government] for self-serving behaviour” (p. 14). Given their ability to generate revenue through the taxation system, the government is in a situation similar to a private firm with large discretionary cash flows, that “blunt the threat of financial distress and reduce its effectiveness in deterring wasteful investment in all but the most extreme cases” (p. 14). Conversely, the concentration of investment across a relatively few number of investors encourages monitoring and accountability, resulting in stronger business and consumer confidence (Hodge 2004).

Although these factors point towards more effective management by the private sector, Klein (1997) cautions that efficiency gains vary and realised benefits are most questionable when the private firm is subject to monopoly regulation. This has implications for the use of PPPs in such environments.

Also, Malone (2005) refers to the findings of the Fitzgerald Review (Fitzgerald 2004) into the provision of infrastructure in Victoria noting that the private sector are “better at project managing one-off, highly complex, or unique projects and that the advantages of using the private sector to provide ‘standard specification’ buildings were less clear” (p. 427). This very point emphasises the need to review funding arrangements on a case-by-case basis.

## Financing benefits of PPPs

A number of private sector financing benefits are

often proposed. These include the availability of private sector finance and innovation provided by private sector financing arrangements. Recall that all of these arguments should be assessed from the perspective of the project, not the borrower. That is, the appropriate cost of capital should be determined by the risk of the project and not the identity of the borrower.

#### AVAILABILITY OF FINANCE

There is no doubt that there is a substantial amount of funds available to finance infrastructure type investments. A significant component of the investor base finds high-yield, low-volatility assets to be an attractive class of investment. There are substantial funds available to finance the type of assets that might be the subject of a PPP.

But these funds are attracted by the nature of the assets being borrowed against, not the particular identity of the borrower. There is no external reason that government could not tap the same pool of funds to finance an infrastructure asset. One reason that *has* been proposed in this regard is the reluctance of governments to increase borrowings on their balance sheets. If this prevents government from financing infrastructure development itself, then it should be recognised that the use of private sector financing is the result of a blanket government policy rather than a proper financial assessment.

#### FINANCIAL INNOVATION

It is common for PPP proposals to incorporate innovative financial arrangements that include different tranches of debt, hybrid securities, refinancing arrangements, and so on. It has been argued that the private sector is more equipped to take advantage of innovative financing structures using leverage, private placements (debt and equity), hybrid securities, and syndicated debt (Brown 2005). This sophistication in financial markets has fuelled the propensity for private investors to become involved in PPP arrangements (Malone 2005).

But there is no reason that government financing, arranged by a specialist agency such as Queensland Treasury Corporation, is restricted to plain vanilla bonds.

#### RISK TRANSFER

A key issue of combined public and private sector involvement in the provision of infrastructure is the notion of risk transfer. A government's desire to

commit to a PPP is based on their ability to transfer much of the project risk to the private sector while achieving their favoured outcome of delivering the good or service. While this capacity to transfer risk is cited as a major benefit of PPPs, an incorrect risk allocation between the two parties (public and private sectors) may result in a sub-optimal outcome for government.

Grimsey and Lewis (2002) discuss the features of infrastructure investment and the risks attached. Such projects are long-term (duration), illiquid (the ability to transfer ownership between parties is limited), capital intensive (large cash outflows at the beginning of the project with investment returns spread over a long period of time), and valuation involves complex analysis, taking into account embedded options and government guarantees. For this investment there are numerous risks involved in the design, operation, and maintenance of such activities: technical (engineering and design failure), construction (delays, material), operating (excessive maintenance and repair issues), revenue (forecasted sales not realised, incorrect costing), financial (inadequate hedging practices), *force majeure*, regulatory (unsupportive government policy), and project default risk.

The prevailing view is that risks should be allocated to the party best able to manage and control them at the lowest cost. This objective will dictate two aspects of any planned project: (1) which funding arrangement to use and (2) if a PPP is the most reasonable approach, the extent of involvement of each party throughout the various stages of the project (design, construction, operations, and maintenance). From the government's perspective, transferring project risks to the private sector is a desirable characteristic of PPPs. However, if an inadequate level of risk is transferred to the private sector, the government is burdened with excessive costs, and projects become quasi-public with funding removed from the government's balance sheet (Brown 2005).

An illustration of this situation is provided by Watson (2002). He discusses the example of the UK Royal Armouries contracting with a private sector firm to operate and maintain a new museum in Leeds. While the private sector firm was allocated the operating and revenue risks, the government was forced to intervene in the museum's operation as the private firm became financially distressed. As an example of the government's inability to transfer the relevant project risks, the government was required to maintain operation of the facility due to closure of the museum being politically unacceptable. Using this example, Watson provides two caveats to the

risk transfer issue which must be considered with allocating the risks of the project between the public and private sectors:

- The private sector must be capable of accepting the risk (legally and financially).
- The public sector must be capable of transferring the risk (legally and politically).

The appropriate funding arrangement for a project must be assessed on a case-by-case basis and these two points are relevant to this decision.

Ultimately, the PPP proposal will specify the risks that are to remain with government and those that are to transfer to the private sector. Subject to the caveats above, what is then needed is a framework to assess whether the benefits (to government) of risk transfer exceed any costs. This is where this section is relevant. There we establish that the standard valuation framework, properly applied, can be used to assess even net cost projects. All that is required is a set of forecast cash flows and estimates of the risk associated with those cash flows under each alternative. Standard valuation principles can then be used to compute a net present value for each alternative. Moreover, the data required to implement this approach is already collected as part of the project evaluation exercise for Queensland government projects.

## Conclusion

Infrastructure investment is vital for sustainable economic growth and development in the long-term. There are three options available to fund such investment: public, private, or a combination of these through a PPP. Because the returns available to investors in some projects are insufficient to attract private sector involvement, the government must intervene in this market and provide the good or service itself, or in tandem with the private sector.

When a particular project involves predominantly net cash outflows, the government must decide whether to complete the project “inhouse” or to involve the private sector in the provision of the good or service. The appropriateness of each funding arrangement is dependent on the individual characteristics of the project, and one financing arrangement is not always preferable to another.

When a PPP is proposed it is critically important to ensure the allocation of risks is fair and that the assigned risks are incorporated into expected cash flows. Furthermore, any transferral of systematic

risk must also be properly reflected in the valuation. This can all be accommodated within the standard valuation framework.

Our key conclusions in relation to the financing decision are:

- The relative merits of a PPP proposal can be assessed against traditional government procurement using the standard valuation framework that is applied in all other settings.
- A number of the proposed benefits of PPPs relate to improvements in the design, construction, and operation of the infrastructure asset. We argue that such benefits can be separated from the financing of the asset. That is, the benefits of private sector involvement in design, construction, and operation do not necessarily require private sector financing. Proper design of contracts can separate financing choices from other aspects of the project.
- It is not the case that one form of financing is always superior to the other. It is equally simplistic and wrong to argue that (a) the government cost of borrowing is lower so government financing should be preferred; or (b) the private sector is more able to access and structure financing arrangements so PPPs should always be preferred. This assessment must be made on a case by case basis, using the framework we outline in the paper.
- The key task in assessing PPPs against the PSC is to properly measure and properly account for any risk that is transferred from government to the private sector. Which financing method is preferred will depend crucially on how different cash flows are balanced against different risks. While the standard valuation framework can be used to perform the required analysis, it relies on risk and risk transfer being properly measured.

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## Endnotes

- 1 Hirshleifer (1965) argues that in the absence of market failure, public and private projects should be evaluated on the same basis. However, in the presence of market imperfections Arrow and Lind (1970) suggest that the public sector requires a lower equity premium than the private sector as governments can forcibly spread risk across taxpayers. However, these arguments are conditioned on project returns being uncorrelated with national income and the returns earned on other projects, which is not a realistic assumption. Using the example of toll-road infrastructure, we expect that as the economy expands, consumers will purchase more cars, and the revenue earned from the tolls will increase. That is, there is a direct relationship between the returns earned on the project and changes in national income. Furthermore, the proposed diversification benefits that can be achieved by the public sector should be equally open to the private sector, given that public capital markets have provided an efficient mechanism for insuring risk (Brealey et al., 1997). Grant and Quiggin (2003) considered two deviations from perfect capital markets and concluded that there will be a range of public projects, some of which will require lower returns than the corresponding private project, while others will require higher returns.
- 2 This section establishes that the relative merits of a PPP proposal can be assessed against traditional government procurement using the standard valuation framework that is applied in all other settings. The ad hoc approaches that are used in some other jurisdictions are unnecessary and wrong. We demonstrate that the standard valuation framework works perfectly well – the problem is not with the framework itself, but with its mis-application by some decision-makers. Readers willing to accept this point can proceed directly to the next section.
- 3 In a diversified portfolio, some assets will be the subject of unexpected good news and some the subject of unexpected bad news. The more diversified the portfolio, the more the good will tend to cancel the bad, leaving the investor with no net exposure to these diversifiable risks. These diversifiable risks are not relevant to asset returns under the Capital Asset Pricing Model, since investors are considered to hold diversified portfolios and therefore have no net exposure to such risks.
- 4 Some firms are relatively more exposed to systematic risk and therefore require higher return premiums. Firms whose returns increase sharply in response to positive market news and decrease sharply in response to negative market news have high systematic risk. Firms whose returns are largely insensitive to market news have low systematic risk.
- 5 The remainder of this sub-section simply puts some more formal structure around this principle. Readers unfamiliar with the algebraic expressions can safely skip the next section at this point.

# 3 Sustainable Queensland Infrastructure

BY MARK INGHAM

## Executive summary

Past research conducted by CEDA to examine the issue of infrastructure highlighted a number of challenges for the Queensland government. It called into question the level of infrastructure spending and the role of the public sector in infrastructure provision. Many commentators, including CEDA, have argued that increased investment in infrastructure will be required to sustain economic growth and that, given the constraints of government fiscal policy, the role of the private sector in funding infrastructure should be more significant.

The Queensland government has addressed the challenge for further investment in key economic and social infrastructure in the state through strategies such as the South East Queensland Infrastructure Plan and Program (SEQIPP). The quantum of funds invested as part of these programs is expected to exceed amounts invested in recent history. Access Economics (2006) notes that Queensland has the second largest pipeline of infrastructure projects of any Australian state or territory. Only Western Australia, which itself is riding the wave of the current boom in the mining sector, has a larger infrastructure program. This year, the Queensland government is forecasting it will spend \$11.6 billion on infrastructure across the state.

However, while the need for greater infrastructure investment is clear, equally important is the need to sustainably manage infrastructure investment. Importantly, infrastructure investment should be considered as a means to an end, not an end in itself. The government's success in infrastructure provision should not be measured just by the quantum of funds invested but how infrastructure contributes to achieving economic, social and environmental objectives.

Challenges in infrastructure provision are not unique to the Queensland government. Uncertainty, scarcity in the availability of funds for investment and competing priorities present challenges to all governments in infrastructure planning and delivery.

The issues that the government will need to deal with extend beyond increasing the amount of investment in infrastructure and include the price of infrastructure services, project prioritisation, project funding, and creating mechanisms that ensure efficient utilisation of infrastructure.

Sustainability requires that future generations are not compromised by the investment decisions of current generations. A position of sustainability in infrastructure provision will not be achieved where:

- investment decisions are not properly guided by appropriate project appraisals;
- investment decisions are made where there are poor, or distorted price signals;
- users are unwilling to pay for infrastructure services; and
- infrastructure expenditure<sup>1</sup> is not funded efficiently.

Quite correctly, the recent debate on infrastructure has focused on the need for timely delivery of infrastructure. But it should be noted that the Queensland government is in a position where it can significantly influence the economic prosperity of current and future generations through the investment choices it makes as part of its infrastructure program. In particular, it may be timely to reinforce elements of the policy framework that governs infrastructure provision:

- ensuring that the long-term impact of infrastructure investment decisions are evaluated – a key risk of infrastructure investment is that there is a long lead time for any adjustment in capacity to reflect changes in demand. If a long-term view is not taken the risk is that the focus will be on short-term costs not longer term solutions;
- ensuring that project prioritisation decisions are made on the basis of comprehensive information encompassing financial, economic, social and environmental parameters;
- seeking infrastructure solutions that advance more than one issue, for example, solutions that provide

improve efficiency, social outcomes and the environment;

- identifying key risks in project delivery and allocating them to the party in the best position to manage those risks;
- facilitating competition where possible in the delivery of infrastructure;
- ensuring there are no distortions in setting prices for infrastructure services;
- facilitating competitive outcomes in prices through effective regulation;
- ensuring consistency of regulatory oversight in the infrastructure sector;
- facilitating market-focused outcomes which correct for explicit market failures such as externalities;
- creating a monitoring environment that focuses on the risks and outcomes in delivering projects.

Sustainably managing infrastructure through appropriate pricing, funding and prioritisation frameworks is important to ensure that maximum benefits are accrued from the significant investment the Queensland government is currently making in key social and economic infrastructure. For that reason, CEDA believes the debate on the issue of sustainability in infrastructure provision should be heightened and that the government should effectively meet the challenge presented by it.

## Introduction

The issue of public sector infrastructure provision has been extensively researched by a number of organisations, such as CEDA, AusCID and ACCI.

CEDA last reported on infrastructure issues extensively in its report *Infrastructure – Getting on with the Job* in 2005. The findings of that report were wide-ranging and it concluded that:

- much of Australia's infrastructure was at a crossroads and that elements of the nation's infrastructure were in serious disrepair and struggling to cope with the demands of Australia's economic growth;
- there was a serious backlog in infrastructure investment in water, energy and land transport, estimated conservatively at \$25 billion;
- there was evidence of a strong link between infrastructure investment and economic growth

and that a shortfall in infrastructure investment would negatively impact on future economic growth;

- institutional structures appeared unable, and ill-equipped, to grapple with the nation's backlog in infrastructure;
- fiscal policies of budget surpluses and debt reduction pursued over the last decade by governments in Australia have led to reduced public investment in infrastructure. Simultaneously, large capital resources have accumulated in the private sector, which could be increasingly tapped into for infrastructure investment;
- public administration in Australia working alone seemed no longer up to the job of infrastructure delivery. Therefore the managerial, financial and engineering skills of the private sector should be deployed more fully, together with public-sector expertise, into the national task of infrastructure provision.

As outlined in this chapter, not all of the findings of CEDA's earlier work can be fully translated into the current Queensland context. With the passage of time, the Queensland government has been responding to the infrastructure challenge. However, in its 2005 report, CEDA also concluded that issues of sustainability in infrastructure delivery were likely to become significant and that a national framework would need to be implemented, taking into account environmental, social, as well as the economic aspects, of infrastructure delivery.

The issue of sustainability is one the Queensland government is confronting in a number of sectors. As indicated in the 2005 CEDA report, shifting from a carbon-rich to a carbon-constrained economy, dealing with inefficiencies in our road and rail systems, and drought-proofing our cities will be challenges we need to deal with for some time to come. These issues are equally relevant to the current environment within which Queensland finds itself.

Accordingly, this CEDA research paper examines the main challenges faced by the Queensland government in ensuring sustainability in the provision and management of key economic and social infrastructure. This study is presented as a series of sections:

**Section 1** sets the context of the study, examining the current infrastructure environment in Queensland.

**Section 2** examines a number of sustainability issues – project prioritisation, project funding and procurement, pricing and capacity management.

**Section 3** concludes with an outline of infrastructure sustainability policy framework.

## Section 1: The Queensland Context

### Key points

- Past studies on infrastructure have focused on the perceived shortfall of infrastructure investment and the constraint that it places on economic growth. However, the debate about the need for greater investment in infrastructure in Queensland has largely passed. The Queensland government is currently focused on the delivery of a significant infrastructure program.
- The scale of the proposed investment in Queensland raises issues of sustainability. The sustainable management of infrastructure requires that the ability of future generations to meet their needs is not compromised by the demands of current infrastructure investment. Therefore how projects are prioritised, funded, delivered and eventually priced will form part of a sustainability focus.
- Infrastructure is not an end in itself, but rather a means to an end. Infrastructure policy needs to support other policy initiatives and not produce conflict between infrastructure delivery and broader economic, social and environmental objectives.

### Infrastructure expenditure

#### THE PAST

Past studies on infrastructure conducted by organisations such as CEDA, ACCI and AusCID, focused on a perceived shortfall of infrastructure investment and the constraint that it places on economic growth.

In its 2005 report, CEDA commented that infrastructure investment in Australia had begun to decline in the 1980s as governments increased the share of public consumption expenditure in their budgets at the expense of public investment. Government capital expenditure, as a share of GDP, fell from approximately 7 per cent in the 1980s to as low as 3.5 per cent in 2003–04. As a consequence, a view was expressed in the report that infrastructure investment was unlikely to meet future needs.

At that time similar observations were made about infrastructure investment in Queensland by other commentators. Ships queuing for berths at Dalrymple Bay port, water restrictions instead of more appropriate pricing mechanisms and significant traffic congestion were cited as examples of inefficient and unsustainable infrastructure development.

Population growth, coupled with increasing demand for scarce government funds, has created challenges for the Queensland government in ensuring that the type and level of infrastructure investment is sufficient to service the current population and forecast growth.

This has implications for both the national and Queensland economies. Queensland is largely responsible for Australia's most successful exports, such as primary products like coal, bauxite, beef and sugar. Infrastructure problems in Queensland have national consequences, as federal Treasurer Peter Costello acknowledged in his comments on the inadequacy of coal port loading capabilities in Queensland.

That being said, there are few publicly available reports on the state of Queensland's infrastructure.

In 2004, Engineers Australia published its infrastructure report card for Queensland (the *Engineers Australia (EA) Report*). The EA Report followed on from the *2000 Report Card on the Nation's Infrastructure*, an expanded national review in 2001 and a New South Wales report in 2003. The EA Report rated the quality of roads, railways, airports, seaports, water, stormwater, electricity supply, gas and telecommunications infrastructure in Queensland and identified key infrastructure deficiencies.

The report found that although Queensland infrastructure was generally in a better state than the average for Australia, it should not be a cause for complacency, especially given Queensland's high population growth forecasts. The highest performing areas were in water supply, telecommunications, airports and ports, which all achieved a B– rating or higher. However, the transport, rail and gas sectors were only rated as adequate and the electricity sector performed poorly.

EA assigned a rating to each infrastructure class – detailed in Table 1.

**TABLE 1: ENGINEERS AUSTRALIA RATINGS**

A (Very good)	Infrastructure is fit for its current and anticipated purpose in terms of infrastructure condition, committed investment, regulatory appropriateness and compliance and planning processes.
B (Good)	Minor changes required in one or more of the above areas to enable infrastructure to be fit for its current and anticipated purpose.
C (Adequate)	Major changes required in one or more of the above areas to enable infrastructure to be fit for its current and anticipated purpose.
D (Poor)	Critical changes required in one or more of the above areas to enable infrastructure to be fit for its current and anticipated purpose.
E (Inadequate)	Inadequate for current and future needs.

Urban and rural roads were rated separately in the EA Report on the basis of asset condition, asset availability and reliability, asset management, sustainability and security. Overall, urban roads received a C rating and rural roads a C+ rating. For state roads particularly, the EA Report found that although the condition of the roads was adequate, serious issues exist in terms of capacity and reliability in urban areas. There are also environmental impacts of state roads in urban areas and safety problems in rural areas that need to be addressed.

The Queensland Rail Network received a rating of C+. Despite rail reform and increased investment, the EA Report found that plans had not been made, at the time, for capacity and reliability improvements because of the continuing uncertainty over the future funding of the National Rail Network. Funding to the road network significantly exceeded funding to the rail sector, resulting in penalisation of the rail sector in attempts to compete against road freight transport.

Aviation infrastructure was rated B. The condition of assets at airports was found to be generally good. Regional airports rated lower than major airports partly due to slow implementation of security measures.

Port infrastructure varied between acceptable and very good levels, receiving an overall rating of B-. Major ports generally performed marginally better than minor ports. Asset condition, availability and reliability were found to be generally good. However, the EA Report identified a lack of committed funding for ports and an absence of a committed approach to security and risk management.

Water infrastructure services achieved generally solid ratings in the EA Report. Urban water treatment and urban waste-water treatment both received a B rating, while urban water reticulation rated a B- because of concern over the current low levels of asset renewal investment. Minor changes are required in relation to irrigation infrastructure, including improvement of water resource planning processes, on-farm water-use methods and rural water-use efficiency generally. However, the condition of irrigation infrastructure in Queensland was better than in the majority of states. Urban waste-water reticulation achieved the lowest rating (C-) because of the relatively poor understanding of asset condition, limited investigation of inflow and infiltration in existing systems and the significant number of overflows that occur during wet periods.

The EA Report indicated that due to drought and reductions in the amount of water available from major water sources across the state, new sites for water harvesting infrastructure must be identified and secured. The EA Report indicates that integrated urban water management (IUWM), which involves taking a holistic view of the water cycle in order to provide increased water efficiency, will be an important strategy for developing water infrastructure. An IUWM is planned for the SE Queensland region, along with progressive capacity upgrades to existing waste-water treatment plants.

Stormwater infrastructure received a B rating, with Queensland performing slightly better than other states due to more attention being paid to stormwater management there than elsewhere in Australia. Although stormwater infrastructure was generally rated as good or adequate for asset management, investment, planning processes and sustainability, the EA Report flagged as a major concern the fact that many councils have either no stormwater quality infrastructure or little understanding of their stormwater quality assets.

Queensland's electricity industry received the lowest rating of all sectors (D+). Although the generation and transmission sectors performed well (B+ and B respectively), the distribution sector rated poorly, with the report indicating that the capacity and reliability of the sector are a cause for serious concern. The report attributed the failings to shortcomings of Ergon Energy and Energex, the two government-owned corporations responsible for electricity distribution in Queensland. In particular, poor performance in the distribution sector was largely caused by problems with management practices over an extended period and a failure to quickly come to terms with the state of inherited network assets. It recommended major capital

expenditure, together with increased maintenance expenditure, to bring both networks up to an acceptable standard.

Gas infrastructure was considered adequate, with an overall rating of C, consistent with the national rating for the industry. There is still an identified need for further gas infrastructure in Queensland, with existing gas fields expected to be depleted within the next 20 years. The EA Report found that although it is likely the depleted fields will be replaced with new fields, existing networks will not be able to keep pace with the expected growth in consumption.

Telecommunications infrastructure rated highly (overall B), with telephony and mobile telecommunications services rating particularly well. The report found that significant improvement is required for data services in order to enhance the economic gains that those services have the potential to generate.

#### THE FUTURE – A SIGNIFICANT INFRASTRUCTURE PROGRAM

Since the Engineers Australia Report Card was published, the Queensland economy has moved into a phase of significant investment in infrastructure. Access Economics (2006) notes that Queensland has the second largest pipeline of economic infrastructure projects of any Australian state or territory. Only WA, which is experiencing a boom in the mining sector, has a larger infrastructure program. The Queensland government is forecasting to spend \$11.6 billion on infrastructure across the state, the largest building program in the nation, per head of population. The current infrastructure program has two geographic foci – south-east Queensland and regional Queensland.

Some years ago, the Queensland government introduced a rolling program of infrastructure investment priorities which is published annually in the *South East Queensland Infrastructure Plan and Program* (SEQIPP). The program aims to give 'direction and momentum' to the infrastructure initiatives focused on by the Queensland government over the next 20 years. The plan is intended to be a dynamic document, updated annually by the state government.

The current 2006 plan commits towards \$66 billion in infrastructure projects over the next 20 years, including almost \$28 billion in road and public transport projects, \$90 million to investigate another possible \$14 billion worth of road and

public transport projects, and \$5 billion in social and community infrastructure.

It also includes an expected \$5 billion in water infrastructure projects – excluding the two new south-east Queensland dams and connecting infrastructure – plus \$4 billion on energy networks over the next five years and \$10 billion in expected outlays on energy networks beyond the first five years.

There are around 350 projects in the 2006 plan compared to 230 in the 2005 plan, an increase of around \$11 billion, or 20 per cent on the investment outlined in the 2005 plan.

Of the \$11.6 billion that will be spent on infrastructure across the state this year, approximately \$4.2 billion is dedicated to projects across regional Queensland. These projects focus on expanding and upgrading water, roads, ports, education and training, rail, health and energy infrastructure.

Further details of the current infrastructure program in Queensland are provided in Appendix A to this report.

#### *Role of the government in delivering the infrastructure program*

CEDA's 2005 report suggested that government roles in infrastructure provision, particularly because of funding issues, could frustrate future infrastructure investment.

The role of the government in infrastructure provision in the state will continue to be under scrutiny because of the size of the infrastructure pipeline. Historically, most infrastructure has been provided by the public sector because:

- infrastructure expenditure is of a large scale and therefore has been seen as requiring government financial support;
- some infrastructure has natural monopoly characteristics which has favoured public sector provision. From a regulatory perspective, public sector provision is often seen as the best vehicle for delivering these services;
- some infrastructure has 'public good' characteristics, meaning that users cannot be excluded from consumption and therefore cannot be charged for use; and
- not all infrastructure can be provided on commercial terms. In some cases social benefits outweigh private benefits and therefore the costs

of infrastructure cannot be recovered from users, resulting in the ‘under-provision’ of infrastructure. Areas of Queensland would not have received infrastructure investment if it was not for government financial support.

Some of the debate surrounding the role of the government in infrastructure provision revolves around the characteristics of infrastructure. Infrastructure is not a homogeneous product and a distinction is usually made between economic and social infrastructure:

- Economic infrastructure is commonly defined as the physical networks, facilities and services that enter as an input to industry production processes. Allens Consulting has estimated that over 70 per cent of infrastructure in Australia is economic. Economic infrastructure has been the main focus of the economic reform debate – whether it be privatisation, competition policy reform or private sector participation in funding infrastructure.
- Social infrastructure encompasses those services that enter less directly as inputs into production processes, such as education and health services. Such infrastructure has typically been treated as a public good. However, slowly, the types of reform that have been seen in economic infrastructure are being seen in social infrastructure and greater private sector participation results.

The rationale for public sector provision of infrastructure has historically turned around issues of public good and market failure. However, there is a persuasive view that such issues do not demand that public infrastructure be solely delivered by the public sector. For example, market mechanisms (including the use of government subsidies) have been used to ensure that issues of market failure can be overcome. Over time we have seen private provision of infrastructure increase and public assets moving into private ownership. At the same time the regulatory environment within which these assets operate has become more targeted and efficient thereby allowing greater scope for the private sector to play a role in the operation of public infrastructure.

Despite a movement towards private sector participation, the public sector will continue to be a significant feature of the Queensland infrastructure landscape.

In 2004–05, expenditure by Commonwealth, state and local governments and public corporations in Queensland accounted for nearly 70 per cent of total expenditure on infrastructure in the state.<sup>1</sup>

**TABLE 2: PRIVATE AND PUBLIC INFRASTRUCTURE EXPENDITURE IN QUEENSLAND, 2004–05**

	\$M
<b>Private new engineering construction</b>	3,386
<b>Public corporations</b>	
Commonwealth	613
State and local	2,538
Total public corporations gross fixed capital formation	3,151
<b>General government</b>	
National	526
State and local	3,812
Total general government gross fixed capital formation	4,338

Source: Australian Bureau of Statistics, 2005b.

### *Impact on economic growth*

Although historically the Queensland government has provided more money for infrastructure than the other states, questions have been raised as to whether funding has kept up with the needs of the state’s above-average growth. Some commentators in the past have referred to the situation in Queensland as an infrastructure crisis because of the implications for economic growth.

It is well documented that there appears to be a positive and statistically significant relationship between public investment in infrastructure and long-run economic growth. Kessides (1993) notes that public infrastructure contributes to:

- economic growth, both through supply and demand channels by reducing costs of production, contributing to diversification of the economy and providing access to the application of modern technology; and
- raising the quality of life by creating amenities, providing consumption goods and contributing to macroeconomic stability.

**TABLE 3: AUSTRALIAN STUDIES ON THE OUTPUT ELASTICITY OF INFRASTRUCTURE INVESTMENT**

AUTHOR	OUTPUT ELASTICITY <sup>(a)</sup>
Otto and Voss (1996)	0.17
Pereira (2001)	0.17
Kam (2001)	0.10
Song (2002)	0.27–0.39

(a) The increase in economic output from a one per cent increase in infrastructure investment.

Source: CEDA, 2005.

Recent studies on investment in public infrastructure suggest that it has a positive and persistent effect on economic output, such that a 1 per cent increase in infrastructure expenditure increases economic output by between 0.17 and 0.39 per cent (See Table 3).

When taken at face value it could be concluded that an under-supply of key economic infrastructure may constrain economic growth.

However, despite some infrastructure shortcomings, the Queensland economy has continued to grow. An infrastructure crisis would imply that the economy would fall into recession without the necessary investment, and clearly this is not the case. Any weaknesses in infrastructure provision have been offset by:

- improvements in the productivity of existing infrastructure stock;
- increasing private sector participation in public infrastructure provision;
- removal of excess capacity in infrastructure through increased utilisation; and
- declining costs of infrastructure provision.

Therefore it is important to recognise that an improvement in the efficiency with which existing infrastructure is used can also contribute to economic growth (Crossman 2000). It is not only the size of the capital stock that is important, but also how that stock is used. So while there is little doubt that new investment in infrastructure is essential for sustained economic growth, improving the efficiency in the delivery and use of infrastructure must be an equally high priority for the Queensland economy.

#### *Implications for sustainability*

It can be a challenge defining what is meant by sustainability in an infrastructure context. For the purposes of this discussion the sustainable delivery of infrastructure means that the ability of future generations to meet their needs is not compromised by the demands of current infrastructure investment (United Nations Brundtland Report). Put simply, governments need to balance the infrastructure needs of present and future generations, a particularly important issue in Queensland where there is currently strong population growth.

A position of sustainability therefore means ensuring infrastructure is funded, delivered and used to enhance the net benefits that may be derived by both current and future generations throughout all stages of the infrastructure lifecycle.

In one sense a position of sustainability is difficult to identify. It is somewhat easier to identify conditions where sustainability cannot be achieved. A position of sustainability will not be achieved where:

- investment decisions are not properly guided by appropriate project appraisals;
- investment decisions are made where there are poor or distorted price signals;
- users are unwilling to pay for infrastructure services; and
- infrastructure expenditure is not funded efficiently.

Clearly, investment in infrastructure which is not justified by the level of demand, is funded inefficiently and which can't be paid for will not be sustainable across generations. Each of these issues will be discussed in detail in the next section of the report.

## Section 2: Issues in achieving sustainability

### **Key points**

- The Queensland government has well-developed project evaluation frameworks to assess the costs and benefits of projects. These frameworks have a 'value-for-money' orientation.
- The projects that have been programmed should have passed through this assessment framework.
- Some issues will remain principally because of the dynamic nature of a stressed construction market. Where the costs of infrastructure delivery are increasing:
  - the underlying economics, and therefore benefits, of projects will potentially reduce; and
  - the relative merits of projects may change.
- This environment creates a need for regular scrutiny and review of projects prior to commencement of construction. A challenge for infrastructure agencies in the current environment is to retain focus on issues of feasibility and prioritisation when the primary focus is on delivery.
- It is important to note that the current infrastructure policy framework does not have a primary focus on sustainability. Many of the elements of a framework exist but need to be promoted and integrated more strongly.
- The purpose of project evaluation is to better understand the trade-offs and complementarities

between infrastructure and economic, environmental and social issues. Importantly, the linkages between infrastructure and economic, financial, environmental and social issues need to be fully explored to assess the true net benefits of infrastructure.

- Given that much of the focus on infrastructure in Queensland is on the delivery of projects, an element of the sustainability debate should be on the funding and procurement of projects.
- There has been much debate about the government's ability to fund and deliver infrastructure. In particular, the focus has been on the government's fiscal policy and the impact on infrastructure funding. Advocates of increased private sector participation in infrastructure delivery suggest that shortfalls in government funding should be met by the private sector.
- The state government's financial position is strong. Nevertheless, the size of the infrastructure program will place the state budget under pressure. Either public sector borrowing or increased private sector participation in infrastructure funding may be required in future.
- From a sustainability perspective, it is not the source of funding that is primarily important but how risks are allocated and managed between the public and private sectors.
- An efficient allocation and management of project risk will reduce the cost of project delivery.
- Increases in project costs are a key risk factor in the delivery of infrastructure. The state of the construction market is such that these risks are unlikely to reduce in the near future and therefore steps need to be taken to mitigate these risks.
- The concept of sustainability is a forward-looking one. Therefore, despite being in delivery mode, there are sustainability issues to be addressed in the operation of infrastructure businesses that will influence future infrastructure investment.
- Efficient pricing practices can contribute to the improved management and sustainability of infrastructure services. Prices are the central mechanism by which resources are allocated in the economy. Prices influence the consumption and investment in infrastructure services.
- Where there are distortions in infrastructure prices, investment is unlikely to be efficient.
- Because of their 'lumpiness', infrastructure assets are likely to be over or under-utilised. Much of the focus has been on the costs of infrastructure bottlenecks, but there also costs associated with excess capacity.

- From a sustainability perspective there may be non-infrastructure solutions to some of our infrastructure problems. The creation of markets for capacity and technology improvement may provide cost-effective alternatives to more infrastructure.

## Introduction

As CEDA noted in its 2005 report, infrastructure assets and associated services need to be provided and assessed on a 'whole-of-life' basis to maximise benefits and ensure sustainable outcomes.

In this respect the delivery of infrastructure should be seen as comprising a number of distinct phases:

- a project concept phase;
- a business case phase focusing on the economic and financial merits of the project and how the project will be procured;
- a project execution phase; and
- post-delivery activities – including pricing and asset management.

At each phase there are critical decisions made that impact on the priority of the project over other projects, the risks of delivering the project and, ultimately, its affordability and the benefits that it brings to the community.

Therefore, the sustainable delivery of infrastructure requires a rigorous framework that:

- fully assesses the economic benefits and costs of the project;
- ensures that risks are identified and managed in an efficient manner;
- the project is delivered cost-effectively; and
- where appropriate, the service that the project provides is efficiently priced.

Each of these issues is considered in detail below.

## Project prioritisation

Clearly, in the current climate, where there are many project demands and constraints on resourcing, deciding what projects have priority is an important factor in sustainability. Investment in infrastructure is optimised when the net benefits to society that accrue from that investment are maximised. To achieve this, those projects with the potential to confer the highest net benefit on society should have the highest delivery priority.

The need for those projects that form the SEQIPP and the regional infrastructure programs has been established and the focus is primarily on delivery. However, within an environment where costs are potentially increasing, the relative merits of projects are possibly changing, creating a need to re-assess projects.

On a broader level, a key policy issue is the scope of the evaluation framework. The concept of sustainability requires an evaluation framework that takes into account economic, social and environmental impacts of infrastructure and the links between infrastructure policy and other economic, social and environmental policy instruments.

Infrastructure projects pursued by the state government and the costs associated with undertaking these projects vary over time.

As identified projects change, and the cost of undertaking these projects varies, the priority of

each project should be examined to ensure that available funding and management expertise are available to deliver those which represent the best use of public funds. Projects should be also prioritised with consideration to broader government policy that may be impacted or may impact a particular project.

The SEQIPP, published annually by the state government, highlights significant differences in the type of projects selected from year to year, and their associated costs. Table 4 outlines those projects that have changed in cost by  $\pm$  \$100 million in the SEQIPP between 2005 and 2006.

Changes in the cost of projects identified in the plan, and the identification of new projects, can change the relative importance of undertaking a particular project, as the net benefit of a project may have changed. Notably however, the plan provides little rationale for the prioritisation of projects within the program.

**TABLE 4: PROJECTS THAT HAVE VARIED BY  $\pm$  \$100 MILLION BETWEEN THE 2005 AND 2006**

PROJECT	REGION	2005 \$M	2006 \$M	DIFFERENCE \$M
Gowrie to Granchester Rail Line	Western Corridor	1,050	1,200	150
New passenger rail stock	Greater Brisbane	n/a	236	236
North–South Bypass Tunnel	Greater Brisbane	1,300	2,000	700
Bruce Highway: additional lanes from Boundary Road to Caboolture	Greater Brisbane	n/a	230	230
East–west links: Caboolture to Bribie Island Road	Greater Brisbane	n/a	180	180
Tugan Bypass	Gold Coast	360	543	183
Intra-Regional Transport Corridor: Nerang to Staplyton	Gold Coast	1,600	1,700	100
CAMCOS rail: Beerwah to Maroochydore	Sunshine Coast	1,000	1,100	100
East–west links: Caboolture–Bribie Island Road	Sunshine Coast	na	170	170
Additional lanes: Boundary Road to Caboolture	Sunshine Coast	na	210	210
Various water recycling projects	Regional water infrastructure	107	238	131
Dams and weirs	Regional water infrastructure	266	528	262
Sunshine Coast (ENERGEX)	Sub-transmission and distribution network upgrades	202	375	173
Gold Coast (Energex)	Sub-transmission and distribution network upgrades	598	726	128
Western Corridor State School Infrastructure	Regional state school infrastructure	315	500	185
Greater Brisbane State School Infrastructure	Regional state school infrastructure	177	500	383
Gold Coast State School Infrastructure	Regional state school infrastructure	508	850	342
Sunshine Coast State School Infrastructure	Regional state school infrastructure	791	600	–191

Source: SEQIPP 2005 & 2006

## PROJECT ASSURANCE FRAMEWORK

The public policy framework that guides the evaluation of infrastructure projects has a focus on 'value for money'.

The government's Charter of Social and Fiscal Responsibility requires:

- the direction of resources and activity towards the government's highest priority areas; and
- the provision of strategies to achieve value for money in delivering infrastructure and services to the community

The principal policy instrument for the evaluation of infrastructure projects is the Queensland government's Project Assurance Framework. The framework is designed to apply to a range of project types, both economic and social infrastructure, and defines project management requirements at each stage of the project life cycle. It also includes a 'gateway component', which promotes reviews at the completion of each stage of the project.

The framework is comprised of two elements:

- a cost-benefit analysis guideline; and
- the value for money framework.

### *Cost-benefit analysis*

In July 2006, Queensland Treasury released revised Cost-Benefit Analysis Guidelines. These revised guidelines replaced Queensland Treasury's original Project Evaluation Guidelines released in 1997. The new guidelines are used to assess projects delivered using traditional methods (i.e. those which are not Public Private Partnerships (PPPs), which are to be assessed under the Value for Money Framework).

The purpose of the guidelines is to ensure that a standard methodology is applied in evaluating projects and to ensure that a framework is in place which:

- aligns agencies' policies, projects, programs and activities to the government's stated priorities;
- prioritises individual projects within programs; and
- ensures that project procurement and resource allocation decisions achieve maximum value for money benefit for the Queensland community.

While the guidelines have a value-for-money emphasis, they also cover broader economic and social considerations. The evaluation process involves not only an examination of the financial costs and

benefits over the entire infrastructure life-cycle, but incorporates an examination of the economic and social benefits associated with a project. Therefore, issues of measurement of opportunity cost, shadow pricing, treatment of externalities and other economic-related matters are covered in the guidelines. Furthermore, the guidelines require an explicit consideration of project risk and, in particular, the impact of risk on estimated project benefits and costs. Where the implementation of a project is expected to involve a number of parties, the evaluation is meant to demonstrate how those risks identified can be efficiently allocated and managed between the parties.

Importantly, externalities associated with infrastructure projects should be accounted for in assessing the overall 'feasibility' or net benefits that may accrue from a particular project. Externalities should be identified and accounted for in pricing and costing infrastructure projects to ensure the community and users, for example, are adequately compensated or pay for any third party impacts resulting from the project. However, in practice, given that externalities can be difficult to identify and quantify, often they are not considered in evaluating a project's feasibility.

The main benefit of the guidelines is that it provides a platform for comparison of the net benefits of different projects so that they can be prioritised within the Budget context.

### *Value for money framework*

In September 2001, the Queensland government released its policy on PPPs. At the same time, guidance material was released which set out a framework for analysing and delivering major infrastructure projects, ensuring that the whole-of-life costs and risks of delivering infrastructure are analysed, and that the opportunity for private innovation is properly explored.

The guidance material comprises a framework document that sets out a process for analysing and, where appropriate, implementing PPP proposals, together with a range of supporting documents that provide further details on specific aspects of the PPP process. These supporting documents provide information on:

- risk management;
- project resourcing;
- probity and process governance;
- contract development and management; and
- business case development.

The proposed process to be employed in delivering a service under the PPP framework consists of six separate but interdependent stages:

- 1 Service identification
- 2 Preliminary assessment
- 3 PPP business case development
- 4 Expression of interest
- 5 Binding bids
- 6 Contract management

The first three stages comprise the main project evaluation processes.

The purpose of the service identification pre-project stage is to provide information to agency CEOs to assist them in making an informed decision regarding whether to initiate a project to meet an identified service need. It facilitates a considered response to an identified service need, and clear articulation of the outcome sought to ensure that the developed response will be effective and deliver value for money for the government.

The preliminary assessment stage facilitates an evaluation of the priority and affordability of the project options and the strategic decision of whether to invest in fully developing a business case. In this stage it is also determined whether the project should progress through traditional delivery mechanisms or as a potential PPP project.

The purpose of the business case development stage is to undertake a more detailed analysis of the small number of potentially viable options identified during the preliminary assessment stage to inform the project governing body's decision on whether to invest in the proposed project.

At each stage of the process the detail of the project is further refined and the level of the analysis becomes more detailed. Importantly, the framework does include cost-benefit analysis so that both financial and economic considerations are taken into account in the evaluation process.

#### PRIORITISATION AND SUSTAINABILITY

The concept of sustainability is one that emphasises a long-term, intergenerational and holistic perspective, addressing in a complementary, non-conflicting way, economic, financial, environmental and social issues. One purpose of project evaluation is to better understand the trade-offs and complementarities among these elements that an infrastructure project may produce. Importantly, the

linkages between infrastructure and economic, financial, environmental and social issues need to be fully explored to assess the true net benefits of the investment.

While the current focus in Queensland is very much on infrastructure delivery, the economic role and significance of infrastructure should not take precedence over other dimensions of sustainable economic development – the social and environmental aspects. Impacts of infrastructure on these aspects are equally important. In all infrastructure sectors too much, too little or poorly judged infrastructure may cause undesirable environmental and social impacts. Too much can cause unnecessary environmental and social damage. But equally, too little infrastructure can mean the loss of opportunities to advance social and environmental objectives. An important consideration in the current climate is that infrastructure does not 'crowd out' other initiatives that require budget funding, such as health and education.

Importantly, infrastructure investment involves the consumption of scarce resources, so making well-informed decisions is important for economic growth. As discussed later in this paper, there is considerable cost pressure within the construction industry, which means that infrastructure projects are consuming even more resources, such that:

- the underlying economics, and therefore benefits, of projects may potentially reduce; and
- the relative merits of projects may change.

While it is difficult to argue in the current climate against the need for further transport, water and energy infrastructure, particularly as these are areas previously highlighted by CEDA as requiring further investment, the environment creates a need for regular scrutiny and review of projects. A challenge for infrastructure agencies in the current environment is to retain a focus on issues of feasibility and prioritisation when it is mostly on delivery.

#### Infrastructure funding and procurement

Given that much of the focus on infrastructure in Queensland is on the delivery of projects, issues of sustainability will, of necessity, need to concentrate on funding and procurement.

Much of the recent debate on infrastructure provision has been on how it will be procured and financed and, in particular, what role the private

sector can play. Many studies have argued that by increasing private sector participation more cost-effective and efficient infrastructure outcomes can be achieved.

The capacity of the government to fund infrastructure is dependent on a range of factors including government fiscal policy and infrastructure pricing policies. Given the scarcity of public funds available for investment, the government should direct funding to the most valuable uses. Accordingly, efficiency in infrastructure funding, and challenges associated with raising the capital required to support investment, are central to the infrastructure debate.

In the same way issues relating to the procurement and cost of infrastructure delivery will dominate the infrastructure debate for some time to come.

Queensland has a significant infrastructure program to deliver and it is in an environment where there are limited engineering and construction resources. As a consequence, there is significant cost pressure building within the construction industry and a reduction in the affordability of construction. This may mean that fewer projects can be funded and the potential net benefits of projects be reduced.

#### INFRASTRUCTURE FUNDING

An important issue in the delivery of infrastructure is the government's capacity to fund expenditure. A modern 'principle' of 'good' financial management is the maintenance of budget surpluses. This means that spending decisions are usually reactive to growth in revenues and, in turn, pro-cyclical with the economy. However, as noted by BIS Shrapnel (2006), there is a tendency for the government spending to lag behind the business cycle:

- Spending decisions are normally reactive, in that government decisions on the quantum of expenditure reflect the most recent growth in revenue. The state budget is brought down in June for expenditure in the next financial year and is largely based on revenue growth of the previous year. Therefore, increases in expenditure may not be fully enacted until one to two years after the economy strengthens.
- Cutting back expenditure after a down-turn takes time. Public capital spending normally bears the brunt of spending cutbacks during and following down-turns because it is relatively difficult to cut recurrent spending quickly.

This might suggest that the government is not always in the financial position to fund the necessary infrastructure when it is required. There

has been some evidence of this in the past where there has been an aggressive GOC (Government Owned Corporations) dividend policy that has been required for budgetary reasons, resulting in deferrals of maintenance and capital expenditure.

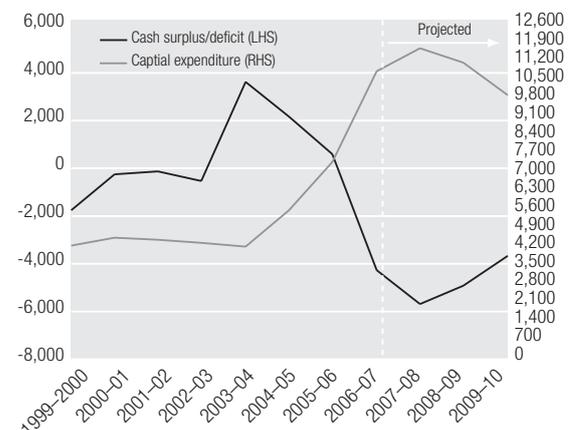
In its 2005 report, CEDA suggested that fiscal policies of budget surpluses and debt reduction had led to reduced investment in public infrastructure. It is for this reason that CEDA has been a strong advocate of private sector participation in infrastructure investment.

#### STATE GOVERNMENT FINANCIAL POSITION

While the size of Queensland's infrastructure program is daunting, it is being delivered at a time when the economic outlook for the state is strong.

The Queensland government's 2006–07 Mid Year Fiscal and Economic Review, released in January 2007, forecasts economic growth of 4.75 per cent, compared with a forecast of 4.25 per cent in last year's budget. It is considerably higher than the national growth forecast of 2.5 per cent. However, even with strong economic growth and a budget currently in surplus, the level of future capital expenditure will create budgetary pressure.

**FIGURE 1: QUEENSLAND GOVERNMENT CASH SURPLUS/DEFICIT AND CAPITAL EXPENDITURE**



Note: Data to 2005–06: actual and estimated data, as available, published in state budget reports. Data from 2005–06: budget and state government projections.

Source: Queensland government Budget papers, various. Data compiled prior to the release of the Queensland Treasury's Mid Year Fiscal and Economic Review 2006.

Accordingly, the Queensland government may need to increase borrowings to fund the proposed projects. However, it is only likely to borrow to fund infrastructure where those borrowings can be

serviced from operating surpluses – to preserve the state’s AAA credit rating. Therefore, the use of the private sector as source of funds for infrastructure is likely to be a feature of the state’s infrastructure program going forward.

There are a number of different options to develop a partnership with the private sector. The most high profile of these is PPPs. Common features of the PPP framework include clearly specified project outputs, payments linked to specified outputs and risk allocation where the party best placed to manage risk accepts it. One of the fundamental benefits of a PPP approach to infrastructure delivery is the reduced exposure to risk by the state and taxpayers. While the state is capable of procuring most projects directly, funding constraints can lead to delays in delivering projects. CEDA has argued that projects designed, constructed and financed by the private sector are consistently delivered earlier than if they had been procured through traditional methods.

However, the evidence to date is that to ensure success, PPPs need careful structuring to reduce the cost of infrastructure:

- the partnership should not just be a method for off-balance sheet borrowing. There are limited benefits from a transaction that just transfers borrowing from the public sector to the private sector; and
- the focus should be on using the comparative advantages of the public and private sectors:
  - the private sector should be used for activities that it is more efficient at, such as construction and operation;
  - it would be less efficient for the private sector to bear large sovereign risks (from changing government policy).

Therefore from a sustainability perspective it should be noted that PPPs, or involving the private sector more broadly, can be a useful tool for reducing the cost of infrastructure investment. However, to do so requires efficient allocation and management of risk between the public and private sectors.

If the proposed risk allocation is not consistent with this principle then the potential value for money from a delivery option will be reduced.

Key factors in the consideration of the risk allocation value for money driver are:

- the skills, experience and resources for managing a particular risk;

- aligning responsibility for managing a risk with the tools and flexibility to manage the risk; and
- the incentives to proactively manage a particular risk.

It is important to highlight here that not only must a party be best placed to manage a risk, they must also be subject to sufficient incentive to actively and continuously manage the risk to the best of their ability. The strongest incentives are typically those that involve a direct and immediate impact upon the financial position of the party.

Project risks can often be misunderstood. Risk is the possibility that an actual outcome will differ from a forecast outcome. The difference between the actual outcome and the forecast outcome does not need to be of an undesirable nature for there to be risk. In other words, a potential positive departure from the forecast outcome also represents risk. This is an important characteristic that is often overlooked by parties not experienced in risk assessment and management. A sometimes related misconception is that a future undesirable outcome of which there is certainty represents a risk. As the outcome is certain, albeit undesirable, there is no risk.

A distinction should be made between systematic (i.e. market-related) and non-systematic (i.e. project specific) risk. Under current PPP guidance being used in Queensland, these are important concepts particularly for quantifying risk and evaluating bids against a public sector comparator. A further distinction to consider is the difference between risk and uncertainty. Broadly speaking, uncertainty is used to refer to future unknown events rather than the typically more readily identifiable probability and consequences for variations around forecast outcomes (i.e. risk). Nevertheless, uncertain events should be identified as part of the risk management process and not simply ignored because they cannot be meaningfully quantified. Risk management is an ongoing discipline that by its very nature needs to be continually reviewed and updated.

#### CONSTRUCTION COSTS – A KEY DELIVERY RISK

Infrastructure projects typically have a relatively long lead time from concept initiation through feasibility, procurement and final delivery. As such, they are prone to cost variation through a range of potential factors, including:

- cost escalation;
- industry activity/structure/competition;
- materials/labour supply; and
- stakeholder changes.

This situation creates a risk of variation in the ultimate delivery cost for the projects relative to the initial estimates, with this variation sometimes being quite significant. There has been a noticeable trend in this regard recently during a sustained period of accelerated construction cost increases (e.g. one measure by the Australian Bureau of Statistics suggests an average cumulative change in Queensland construction costs of just under 10 per cent per annum between 2002 and 2005).

The most pronounced impact of this uncertainty in cost estimates and outcomes is the difficulty in adequately budgeting for individual projects and prioritising alternative projects within an environment of limited financial and technical resources. However, there is also an impact on key stakeholders, with public confidence in stakeholder performance reduced where initial cost announcements prove to be materially understated upon project delivery.

#### *Size of the problem*

There is no single index that neatly represents construction cost escalation. However, a number of cost consultants prepare tender price indices (TPI) quarterly for each state. These TPI take into account labour and material prices as well as market conditions for different types of projects (i.e. demand and supply factors). While the TPI is based on industrial, commercial and residential buildings, it is also a useful indicator of cost pressures in the construction market generally and therefore of relevance.

Table 5 illustrates the movement in the TPI in key states compared to CPI over the period 2002–05. It highlights the significant real cost escalation that has been experienced, particularly in Queensland and WA, but also in NSW and Victoria.

**TABLE 5: CONSUMER PRICE INDEX V TENDER PRICE INDEX 2002–05**

	AVERAGE ANNUAL CHANGE IN INDEX 2002–2005 (%)
CPI	2.7
TPI – Qld	9.8
TPI – WA	9.0
TPI – NSW	6.4
TPI – Vic	5.7

#### *Labour*

Employment within Australia is currently at a record high with only 5 per cent unemployment. This statistic, coupled with the recent growth in demand for infrastructure and building works across all sectors, has seen a shortage of skilled labour available to the construction industry in all states over the last few years. Further, while historically the industry has managed peaks and troughs in the availability of labour via ‘transferring’ labour between the building / civil and resource / mining sectors as required, because of the increase in demand for all types of construction in recent years, this has no longer been possible.

This shortage of labour has had inevitable consequences for labour costs:

- The costs to attract good direct employees are higher due to the limited supply of resources.
- The demand for good subcontractors as an important means of mitigating risk for head contractors has meant that the market has lacked the ability to put pressure on these subcontractors to offer keener pricing.

The skills shortage is compounded by the fact that there are fewer graduates/apprentices coming into the industry and that the younger generation have higher expectations regarding employment opportunities. In addition to the general ageing of the Australian workforce, the level of apprentices and young people going directly into trades has fallen over the years. There is a general consensus in the industry that the skills shortage will remain an issue for some time.

#### *Cost of raw materials*

Key materials in major infrastructure projects include cement, concrete, glass, steel, aluminum and asphalt, with diesel being the dominant fuel used in operating heavy equipment. The pricing for these products is market driven (rather than cost driven) and therefore in an environment where there is high demand, prices increase.

The emergence of China as a country prepared to invest heavily in new infrastructure has increased the competitive pressure on materials and resources from Australia. Currently China needs to import raw materials and commodities from other countries as it cannot produce enough to satisfy its own demand. This demand is leading to increased pressure on the prices of certain commodities and raw materials. Many economists expect China to grow at 7–9.5 per cent per annum over the next

decade. This impact is likely to be compounded with the expected growth in infrastructure development needs in India, which is expected to follow China's boom.

### *Pricing*

The profit margins within the construction industry are regarded as low. This, coupled with the fact that projects are becoming larger in terms of value, means that adverse outcomes on individual projects can have very material implications for a contractor's overall financial performance in any given year.

Contractors have therefore become much more structured in their risk analysis work, undertaking detailed risk identification and using Monte Carlo analysis to price risk. In addition, many contractors have established internal benchmarks and positions that determine whether they will receive internal approvals to bid for a project. In this regard, management focus is very much driven by the risk assessment and adequacy of contingencies and premiums. Risk now carries a true cost in a project and they are no longer prepared to 'buy' work because the consequences of getting it wrong are so severe. As larger projects tie up more capital for a longer period, this is also priced into the underlying costs. The tying up of capital also potentially affects the number of projects a contractor can become involved in at any one time (e.g. one very large project versus numerous smaller ones). Because of this some contractors may prefer a higher number of smaller projects to allow them to maintain a more balanced portfolio approach. Therefore they may require a higher return for larger projects.

Risk pricing is a critical feature of all major projects with much more transparent pricing and management scrutiny over premiums and contingencies included in bid prices. Given the low margin business and a number of large projects that have suffered significant cost or time blowouts as a result of risks materialising there will continue to be more focus on this area by construction companies.

### *Competition*

There are very few contractors operating in Australia who have the capability to deliver on very large-scale infrastructure projects, so the competitive field is limited. Until further players are established in Australia and able to compete against the dominant current players (particularly on the \$1bn+ projects), the public sector comparator (PSC) is really the only benchmark to incentivise efficient pricing. However, it is worth noting that the PSC has inherent limitations in this respect where it is

similarly predicated on large-scale procurement, albeit of a traditional approach. As such, this approach would similarly benefit from increased competition.

### *Tender processes*

A key issue in the delivery of projects is project management. As more projects are either in the construction phase or entering the operations phase, the quality and approach of the contract managers is important.

A key differentiator between private-private projects and public-private projects is probity. Clearly probity has a role to play, but it can stifle necessary communication and may be used as a veil to avoid tackling difficult issues early on. This results in additional costs, guessing what the government wants or expects, whether in relation to design, service delivery or risk allocation. Where the government engages more openly with bidders it benefits the final overall technical solution and very often the price, as more clarity of requirements or expectations allows more accurate pricing.

Bid costs incurred in major government procurements can be large and are often cited as a cost to the industry that ultimately impacts on underlying real costs as companies seek to recover lost bid costs in future projects and/or absorb them into the bottom line. It is an issue that can affect the appetite of the market to participate in a project when there are so much work available elsewhere.

### *Conclusion*

In summary, the underlying market pressures that are driving costs in the construction industry are likely to be around for some time. The challenge for the government is to initiate steps that can mitigate these impacts in the medium to long term.

## CASE STUDY

### RISK ALLOCATION: PROVISION OF ROAD INFRASTRUCTURE

Primary responsibility for the development and management of the road network has traditionally resided with the various levels of local, state and federal government. One option that helps to keep pace with reasonable road infrastructure demands is the imposition of direct user tolls for roads. These charges reduce or offset the financial impost of developing and maintaining road infrastructure, and also possess equity merits in that it minimises or avoids cross-subsidisation of users of the road by general taxpayers.

Despite a few exceptions, recent Australian experience with toll roads has centred on a private sector build-own-operate-transfer model. Both NSW and Victoria have adopted this approach with, for the most part, successful outcomes.

Queensland has been an exception. To date, Queensland toll roads are owned by the state. These include the Gateway Bridge and the Logan Motorway (including Gateway Extension). The current duplication of the Gateway Bridge will also be managed as a state-owned toll road.

While private toll roads attract periodic controversy, as demonstrated by recent events in NSW with the Cross City and Lane Cove Tunnel projects, they are generally a successful delivery model, generating solid financial performance for investors.

#### ARE PUBLIC TOLL ROADS AN OPTION?

Given the potential financial returns available from a toll road, which may also be sized so as to contribute towards the maintenance or upgrade costs of associated network infrastructure, there may be merit in government ownership of toll roads. A government-owned toll road is unlikely to attract less criticism than a private toll road, as controversy is typically around the need to pay tolls rather than who collects them.

Various arguments are used to support government transfer of responsibility for the ownership and operation of toll roads to the private sector. These may include:

- government borrowing constraints;
- optimised risk allocation (including traffic/revenue risk);
- private sector innovation in design and service delivery; and

- whole-of-life costing incentives.

In the absence of other factors that promote private sector delivery of the infrastructure, the issue of potential borrowing constraints alone is not necessarily a conclusive justification for private sector financing of toll roads. The key issues can be summarised as whether the government can manage the infrastructure as well as the private sector and, if so, whether it is appropriate for the government to take on the business risks associated with the project.

#### ARE THE RISKS APPROPRIATE?

The exposure of government to normal construction, commissioning and maintenance risks is more direct under public ownership. However, these can be at least somewhat mitigated through appropriate contract structures and terms, such as design, construct and maintain contracts, provided that these are well managed to protect the government's rights.

The key risk issue becomes whether the government should assume traffic risk. Traffic risk can be attributed to project-specific characteristics and more general economic factors. A toll road may have relatively low traffic uncertainty from project specific factors where:

- the route is already largely established (particularly if there is already a history or acceptance of tolls);
- there are few convenient alternative transport routes or solutions;
- the infrastructure is in the nature of a 'missing link' between arterial roads;
- commercial traffic will form a relatively high proportion of demand; and/or
- development in the key demand generation areas is relatively mature.

In such cases, the main risk component with traffic may be more closely aligned with broader economy level factors, such as:

- the impacts of domestic and international consumption on freight or commercial traffic;
- the impacts of employment cycles on job related travel demand; and
- the impacts of oil prices on travel costs and preferences.

If the private sector is not materially better at managing these economy level risk factors than the government, which seems likely, it may be appropriate for the government to own toll roads with relatively low project-specific traffic risk factors. Further, toll roads with these

specific characteristics may represent a revenue risk profile that is not too dissimilar from the economic level risks government is traditionally exposed to through its traditional tax base revenue sources.

#### SCOPE TO INNOVATE

Key areas for potential innovation in toll road infrastructure include:

- infrastructure design; and
- customer service/product offerings.

Potential innovation in design can be maximised where the road is a new route servicing a relatively undeveloped or underdeveloped 'catchment' area, as greater flexibility in capacity, corridor and road access points may be possible. However, where the infrastructure possesses characteristics similar to those outlined above for projects with relatively low project-specific traffic risk, there is likely to be a reduction in the scope for significant innovation in design. Innovation in infrastructure appearance, construction methods and materials should be largely available to the government under well-managed design, construct and maintain contract structures without necessitating private financing.

Innovation in customer service and tolling products is viewed as an important aspect of optimising value from a toll road, particularly in relation to being responsive to changing market circumstances and maximising the 'ease of use' for potential users. A clear focus on initial and ongoing innovation in this regard is likely to be maximised where the owner emphasises commercial return and the project is a significant part of its portfolio of assets. This is most naturally achieved with a private sector owner.

However, if the government's interest in a toll road is managed through a public sector corporation (or similar special purpose body), which is appropriately empowered and incentivised, it should be possible to at least partly replicate the drive for ongoing innovation in customer service and product design a private sector owner would possess.

#### WHOLE-OF-LIFE COSTING

Whole-of-life costing is a relatively less important driver of potential value in a toll road project as the ongoing operating and maintenance costs are less significant relative to the initial construction costs. It is possible for the government to pursue optimisation of construction and operations/maintenance costs for a toll road through a combination of a well managed [design, construct and maintain] contract and appropriate whole-of-life

assessment of competing road designs and construction strategies.

#### CONCLUSION

While the management of the overall road network remains a government responsibility, the trend towards privately owned toll roads has been utilised to progress development of new or upgrade road infrastructure. Where this infrastructure has characteristics suggesting a relatively high level of uncertainty in relation to traffic, arising from issues associated with the design or location of the road, it may be appropriate to protect taxpayers from this risk by passing responsibility to interested private sector parties.

However, it may not be inappropriate for governments to own toll roads where the level of traffic risk attributable to project specific factors is relatively low. The Gateway Upgrade Project in Queensland is a relevant example, having the features of:

- an established corridor with existing acceptance of tolling;
- limited scope for innovation in design;
- a relatively high proportion of commercial traffic; and
- few alternate transport options.

It is important to recognise that these projects are not 'low risk', but rather the nature of the risks may be less suitable to achieving significant efficiencies through a transfer to a private sector owner.

If the value of a government toll road is to be maximised, it is important that:

- contracts (including the project specification) are well designed and managed;
- a dedicated project management organisation is appropriately resourced and empowered; and
- a performance/remuneration structure is established which incentivises behaviour similar to that expected for a private sector owner.

## Pricing and capacity management issues

Infrastructure has a number of characteristics that makes sustainability difficult to achieve:

- capacity can only be adjusted in large, ‘lumpy’ increments;
- there are high initial fixed costs and low marginal costs of supply;
- there are high sunk costs and risk of assets stranding as demand conditions change;
- there are externalities not reflected in prices; and
- scale and regulatory hurdles create long lead times for installing new capacity.

Taken together, these characteristics make planning efficient infrastructure investment problematic. In particular, issues of pricing and capacity management are critical in determining sustainable outcomes.

### PRICING

Prices are an important mechanism in infrastructure provision. Getting prices right is far from easy, not only because of the difficulty in valuing non-market impacts, but also because of distributional impacts. Major misallocation of resources can arise if prices are distorted.

The awareness of the role of pricing and infrastructure provision has been heightened during the current water infrastructure debate. Efficient pricing practices can contribute to the improved management and sustainability of infrastructure services.

Prices are the central mechanism by which resources are allocated in the economy. Prices influence the consumption and investment in infrastructure services.

Historically, infrastructure prices have not fully reflected the cost of supplying such services, reflecting government policy and community expectations that some infrastructure services should be supplied by the government from its revenues. In part, the government has assumed this role given the public good aspects of some infrastructure services.

Given that further investment in infrastructure is required, and that the private sector will need to fund some of the investment identified by the Queensland government as needed to support growth, infrastructure pricing practices need to be examined to ensure there is sufficient incentive for

supplying infrastructure, and to encourage efficiency in the use of these services.

### THE ROLE OF EFFICIENT PRICING – THEORY

Prices influence demand for infrastructure services. Accordingly, pricing practices that reflect efficient outcomes are central to ensuring that infrastructure services are planned, provided and used in a sustainable way.

If prices are not ‘efficient’ then the correct signals will not be provided to infrastructure suppliers to invest in capacity.

In a theoretical sense, pricing policies that encourage efficient use should:

- reflect the economic costs of supply;
- encourage the maximum utilisation of existing assets; and
- signal to users the costs associated with supplying additional units.

Historically, pricing policies have not been developed with the purpose of achieving these objectives. Often, the price paid by infrastructure users does not even reflect the financial costs associated with funding and constructing an asset, let alone the economic costs of supply.

Infrastructure services have often been under-priced because:

- there is political pressure on the government not to charge for certain types of infrastructure services, particularly social infrastructure such as education and hospitals;
- a key objective of the government is to ensure equity in the distribution of resources, which does not always equate with efficiency; and
- of public expectations associated with public provision of infrastructure, and their willingness to pay.

Although increasingly governments are moving towards recovering the costs associated with providing some types of infrastructure, particularly economic, it is very difficult to simultaneously achieve all pricing objectives by reflecting these in infrastructure pricing frameworks to encourage efficient use.

#### *Marginal cost pricing*

Marginal cost pricing will encourage the efficient use of scarce infrastructure services. Such an

approach reflects the incremental costs of supplying infrastructure services (including any associated economic costs).

Long-run marginal cost pricing is a 'first-best' pricing practice that in theory results in the efficient distribution of infrastructure services – that is, if all other infrastructure services are priced similarly. As the term suggests, pricing that reflects long-run marginal costs incorporates the short-run marginal costs of supply and the costs associated with augmenting capacity to accommodate demand.

However, in practice it can be difficult to price infrastructure services at the marginal cost of supply, the approach required to satisfy the efficient pricing principles.

Importantly, marginal cost pricing is often not the preferred approach for pricing infrastructure services given the nature of infrastructure investments; services are often supplied by natural monopolies and investments are lumpy and long-lived.

Where infrastructure assets are priced at marginal cost and there is significant excess capacity in the asset, marginal cost pricing may result in a loss for the infrastructure supplier. Accordingly, alternative approaches are often pursued, such as those considered to be 'second best'. Often regulators and the government pursue approaches to pricing such as Ramsey pricing, multi-part tariffs, and peak pricing to recover some of the fixed or capital costs associated with an infrastructure investment.

### *Rate of return targeting*

Rate of return (RoR) targeting by infrastructure providers has important implications for pricing and efficiency. A pricing solution that does not reflect a corporation's target rate of return is unlikely to result in an 'efficient' outcome. The RoR some government-owned monopoly providers of infrastructure earn is recommended by state or territory regulatory agencies, such as the Queensland Competition Authority.

As outlined below, the RoR that has been earned by most Queensland GOCs would be regarded as low. Pricing structures that reflect these relatively low rates of return are unlikely to signal to users emerging capacity constraints in the use of infrastructure services. However, RoR targeting may detract from achieving an efficient outcome where:

- an entity may choose to increase prices or lower service quality to achieve an RoR target, rather than addressing underlying inefficiencies; and

- the target may be achieved at the expense of capital maintenance and investment programs.

Accordingly, consideration should be afforded as to how RoR targeting could impact prices and demand for infrastructure services. Therefore the regulatory environment in which some infrastructure businesses operate will be critical in establishing sustainable outcomes.

### INFRASTRUCTURE PRICING IN PRACTICE

The Productivity Commission recently reviewed the financial performance of government Trading Enterprises. The report provides a useful overview of the commercial performance of Queensland GOCs and gives guidance on the level of efficiency in which infrastructure is employed.

Part of the Commission's focus was on the RoR on assets that GOCs were earning. Return on assets is the ratio of earnings before interest and tax (EBIT) to average total assets and indicates how effectively the assets of the GOCs are working in order to generate a profit.

6 presents time series information on the rate of return on assets that has been earned by Queensland GOCs. It is apparent that returns earned by Queensland GOCs are relatively low. For example, in 2004–05 eight of the GOCs listed recorded returns lower than the ten-year government bond rate of 5.4 per cent.

Clearly, an issue that requires further consideration is how infrastructure is priced and, just as importantly, the relationship between price, asset valuation, dividend policy and capital structure. To the extent that pricing structures influence the use of infrastructure and investment decisions, an important part of the sustainability equation must be to set prices at correct levels to influence the correct level of investment at the 'optimal' time.

For most of the GOCs in Queensland there is a well-defined regulatory framework overseen by the Queensland Competition Authority (QCA). The QCA is an independent statutory authority consisting of members appointed by the Governor in Council.

The QCA's main responsibilities are to ensure that:

- significant government business activities that compete with the private sector do so fairly (competitive neutrality);

- government-owned monopolies and privately-owned monopolies do not abuse their market power (monopoly prices oversight); and
- essential infrastructure is accessible to all potential users (third party access).

In terms of its monopoly prices oversight, the QCA considers that prices should:

- be cost reflective;
- be forward looking – insofar as they represent the least cost which would be incurred in providing the service;
- ensure revenue adequacy;
- ensure regulatory efficiency;
- take into account matters relevant to the public interest; and
- promote sustainable investment.

The intention of such principles is mainly to ensure that prices reflect competitive outcomes and that

GOCs have sufficient incentive to continue to invest. But they also address situations where inefficient and unsustainable investment decisions are made. The QCA adopts deprival value methodology for the valuation of GOC assets and provides for ‘optimisation’ of the assets. This means that the valuation of assets can be based on the optimal configuration of assets, allowing for advances in technology and design and eliminating excess capacity from the asset base. It therefore reflects the outcomes of a competitive market and provides a forward-looking dimension to valuation. It ensures that regulated prices do not reflect previous ‘gold-plating’ of infrastructure and also minimises incentives for inefficient bypass of system assets.

However, while regulatory framework is sound, some commentators have called into question how effectively it is being implemented. A recent scorecard of the effectiveness of economic regulation of infrastructure commissioned by AusCID (2006) suggested that regulation in Queensland was of a fair standard – rating regulation of ports and rail as

TABLE 6: QUEENSLAND GOCS – RATE OF RETURN ON ASSETS (2000–01 TO 2004–05)

SECTOR	GTE	2000–01	2001–02	2002–03	2003–04	2004–05
<b>Electricity</b>	CS energy	6.2	7.4	5.7	4.7	4.1
	Stanwell	9.7	5.8	4.7	4.6	3.9
	Tarong	10.5	8.2	6.4	8.1	8.3
	Enertrade	-3.1	-16.7	-5	-3.8	-14.3
	Powerlink	7.6	6.2	6.3	6.7	6.9
	Ergon	5.1	5.7	6	5.9	5.1
	Energex	6.3	6.6	7.2	7.9	6.7
	<b>National average</b>	<b>7.4</b>	<b>6.9</b>	<b>7</b>	<b>7.8</b>	<b>9</b>
<b>Water</b>	Sunwater	2.2	9.7	6.9	5	11.9
	<b>National average</b>	<b>5.8</b>	<b>5.3</b>	<b>5.4</b>	<b>5.8</b>	<b>5.7</b>
<b>Rail</b>	QR	6	6.5	5.4	5.4	6.7
	<b>National average</b>	<b>3.5</b>	<b>3.4</b>	<b>0.9</b>	<b>-7.1</b>	<b>2.9</b>
<b>Port</b>	CQPA	4.4	6.2	5.9	19	4.3
	Brisbane Port Authority	5	5.4	5.5	5.3	5.3
	Cairns Port Authority	n/a	4.1	7.6	8.3	5
	Port Corps of QLD	n/a	2.4	6.8	7.2	6.2
	Mackay Port Authority	n/a	-0.3	0.6	0.8	1.4
	Townsville Port Authority	n/a	1.7	0.8	2.9	2.1
	<b>National average</b>	<b>6.1</b>	<b>4.7</b>	<b>4.8</b>	<b>7.2</b>	<b>6.6</b>

Source: Productivity Commission

poor and regulation of water and electricity and gas distribution as fair. Overall, AusCID's report suggested that Queensland is behind the other states and considerably behind best practice.

In addition the *Export and Infrastructure Taskforce Report* (Fisher Report) indicated that a key concern was the length of time regulators took to respond to emerging infrastructure issues. The regulatory process for Dalrymple Bay is often used as an example of the need for more open and timely decision-making by regulatory agencies.

AusCID has expressed a view that the regulation of infrastructure is inappropriately focused, because it concentrates on pricing outcomes rather than economic efficiency and investment. Obviously, the decisions by regulators in relation to price have an impact on the investment decisions by infrastructure providers. The key issue is whether regulators are achieving the correct balance between the needs of infrastructure providers and infrastructure users.

## CASE STUDY

### URBAN WATER PRICING IN SOUTH-EAST QUEENSLAND

Current challenges faced in south-east Queensland's (SEQ) water sector can be partly attributed to past pricing practices. Arguably, underpricing has resulted in the inefficient use of the region's scarce water resources, in part contributing to the current water shortages faced in the south-east.

Pricing can be used as an effective tool to manage demand. Despite this, the state's response to the current situation was to augment and construct new infrastructure, and introducing strict restrictions on water use. As an alternative, a non-infrastructure solution, such as pricing, could have been used to ration existing supplies. A pricing solution may have afforded users greater flexibility in their consumption decisions than the adopted approach.

However, it is unlikely that the current situation faced by the south-east could have been managed equitably and efficiently with just a pricing solution. Given the social implications associated with substantially increasing the price of an essential commodity such as water in a short period of time, pricing could have been used as part of a suite of initiatives to reduce the quantum of investment and the severity of restrictions currently placed on use.

### BENEFITS OF EFFICIENT PRICING

Given that water prices are not cost-reflective, the market will not effectively signal to infrastructure managers the level of investment required to support the efficient long-term investment in, and sustainable supply and use of water resources. Notably, the quantum and type of investment required to meet current demand would differ if water was priced efficiently.

To ensure that water is allocated efficiently, prices should reflect the full cost of supplying water, reflecting the least-cost approach to managing and investing in infrastructure. In addition, optimally prices should reflect the relative scarcity of the resource, including any social or environmental costs associated with use. If water prices encourage efficient use, then available water resources will be employed in a more beneficial way. Individually, consumers will be willing to pay for water to the extent that they derive benefit from its use.

However, historically prices in SEQ have not reflected the full cost of using water. Although many local governments in SEQ acknowledge the importance of cost-reflective pricing and the principles of cost-recovery outlined in the Intergovernmental Agreement on a National Water Initiative (NWI), many continue to price water such that they earn a negative or marginally positive rate of return on the water and wastewater assets they manage. The NWI states that water should be priced to reflect the cost of supply (capital and operating costs) and a reasonable return on water assets.

Reluctance to price water to reflect the full cost of supply may in part be due to the political sensitivities surrounding increasing water rates. In addition, despite the obvious benefits in pursuing a pricing solution to manage demand, governments have objectives broader than economic efficiency. These include promoting distributional equity, protecting the disadvantaged, maintaining health and living standards. Accordingly, the government needs to achieve an appropriate balance between efficiency and ensuring that water is affordable for applications necessary to support good health outcomes and a high standard of living.

Despite this, without effective price signalling it is difficult for decision-makers to determine the appropriate response to the current situation – whether to further augment supply by constructing new infrastructure or to pursue further efficiencies by encouraging more effective use.

It is also unclear to what extent current restrictions may negatively impact on the economy, or how further improvements may be derived by allocating water more

efficiently, given that prices are not cost-reflective.

Without effective pricing, water could be inequitably and inefficiently distributed. Water may continue to be used in relatively low-value applications, where higher-value uses may exist. This represents an inefficient use of water that may negatively impact on the sustainability of the resource.

#### COST-REFLECTIVE PRICING FOR SEQ

The Queensland Water Commission has recently released its report, *Cost Recovery and Pricing for Urban Water Supply in South East Queensland*. This draft report was prepared as part of developing a framework for the institutional reform of SEQ's water and wastewater sector.

The objective of the proposed reforms is to ensure water is managed sustainably, in a financially viable manner, and that its management is on an integrated basis to improve security and reliability of water supply. This will necessitate that water and wastewater services are priced to reflect the full cost of delivering the service.

Consistent with the NWI, the Water Commission notes the importance of ensuring that water is priced to reflect the full costs associated with supply. This approach is also in accordance with that adopted by the QCA in its decision on the Gladstone Area Water Board published in March 2005.

The Water Commission notes that the structure of pricing within Grid Sales Contracts discussed in the report will be important to:

- signal to Grid Customers the cost of future sources which may promote localised demand management and source substitution, and allow the deferral of future infrastructure investment;
- encourage retailers to pass through efficient price signals to end-users to manage demand; and
- achieve efficiency in the utilisation of Grid Assets to manage demand (QWC, p.10).

However, the Water Commission has noted that a gradual transition will be required to full-cost pricing to 'soften the immediate impact of price increases on end users', in recognition of the ability of the community to pay higher prices.

As discussed above, the challenge in pricing water is to ensure that an appropriate balance is reached between the need to reflect the cost of supply and managing community welfare outcomes to ensure that water is available and affordable to maintain the high standard of living enjoyed in the south-east.

#### CAPACITY MANAGEMENT/ASSET UTILISATION

Theoretically, there is a level of investment in infrastructure which maximises the net benefits that accrue to society from its use. However, there are significant challenges in achieving the level of investment required to support current and future demand for such services. As seen above, the timing of investment and pricing policies can be linked.

Because of their 'lumpiness', at any point in time infrastructure assets are likely to be over or under-utilised. This has significant implications for efficiency. Accordingly, capacity management is crucial to ensure that the benefits of infrastructure investment are maximised.

#### *Finding a 'balance' – congestion v. excess capacity*

Timing the construction of new infrastructure to accommodate demand is crucial in determining the potential benefits that may accrue to society. Much of the frustration in the infrastructure debate stems from the fact that infrastructure capacity is not available when it is required.

Uncertainty influences all stages of the infrastructure life-cycle including the funding, planning, construction, maintenance and operation of infrastructure assets. The challenge for the infrastructure provider, in many cases the government, is the trade-off between two evils – short-term disruption and increased costs as an asset reaches full capacity or to incur the ongoing costs of excess capacity?

The over-utilisation of infrastructure services impacts on the efficiency of services provided by infrastructure assets. Congestion is often cited as evidence of the over-utilisation of infrastructure services as it imposes an additional cost on users of infrastructure assets.

However, importantly congestion is not necessarily evidence of infrastructure 'undersupply'. Improvements in the efficiency with which infrastructure assets are used, which could be achieved through cost-reflective pricing and by using other demand management tools, could address issues of congestion.

In Queensland, the efficient operation of the coal export logistics chain is critical to maximise the net benefits that may accrue to society from the state's booming mining sector. Mismatches in capacity between different stages of the network and the timing of capacity at different stages can affect the efficiency, and thus the cost of exporting commodities such as coal. Queensland's GOCs influence the efficiency with which these systems operate, and thus

affect the overall efficiency of Queensland's coal logistics chain. Inefficiencies at any point in the chain have the potential to adversely impact other supply-chain operators.

Excess capacity results when infrastructure assets are less than fully utilised. Importantly, excess capacity represents an opportunity cost to society where public funds are invested, if these funds could better be used elsewhere.

Excess capacity often results, given that most infrastructure is constructed to accommodate future growth. Given infrastructure assets are long-lived, and there are significant economies of scale in the construction of most infrastructure types, the profile of expenditure on infrastructure over time is lumpy. Accordingly, constant or increasing investment in infrastructure assets may not be required where existing assets have sufficient capacity to support an increase in demand.

An important public policy issue is the trade-off between short-term congestion and the costs of holding excess capacity. This is particularly important in an environment where infrastructure prices do not, or cannot fully reflect economic costs.

There are significant challenges in achieving the 'right' balance of investment in infrastructure services. The nature of infrastructure investment is such that there will always be a mismatch between demand for infrastructure and its capacity, resulting in either bottlenecks or excess capacity. This is an important point. Much of the infrastructure debate has been focused on the costs of bottlenecks not the costs of excess capacity.

Many of the issues we are now faced with are the result of unexpected increases in demand and there has been insufficient time to expand capacity to meet that demand. Furthermore, the limitations of capacity can, in many instances, be addressed through operational initiatives not just by expanding infrastructure. In many cases this may be more cost-effective.

That is not to say that infrastructure planning cannot be improved. Understanding future demand and planning for it are critical ingredients to avoid some of the issues we are currently faced with.

### *Capacity trading*

In some circumstances, the achievement of sustainability may mean that non-infrastructure solutions are required for infrastructure problems. For example, in a number of regulated transport sectors (both rail and ports) there has been a renewed interest in the possibility of users trading in contractual capacity entitlements.

Movements towards capacity trading are especially evident where there are binding constraints on existing capacity and impediments to the development of additional capacity. Locally, QR and some of the coal ports have indicated that capacity trading frameworks are under active consideration.

The advent of capacity trading raises a number of issues for the regulatory and commercial management of volume risk:

- How does one account for capacity trading in tonnage forecasts, given that contractual responsibilities may be able to be shifted between parties, perhaps lessening the effectiveness of take-or-pay/over-use penalties?
- Does capacity trading undermine one of the original intentions of utility regulation, being to protect the end-user from the exercise of market power? In one sense, by converting a contractual capacity entitlement to a tradeable commodity it might allow the holder of this entitlement to seek to extract some sort of monopoly return. (A converse interpretation is that the scarcity value of any capacity entitlement has always been present, just embedded into the overall value of the project/entity holding it. Allowing for overt trade in capacity simply brings this value into the open).
- Which party should operate any market in capacity entitlements and, if the market-facilitator is not the network owner, what information flows should be allowed for/required to ensure the efficient operation, management, planning and regulation of the network.

There also are the general issues of ensuring the continued efficient operation of the facility within which capacity entitlements are traded, as well as the interface between rail/ports and the impact on the overall coal supply chain.

However, in the current environment where short-term infrastructure constraints may apply, market-based arrangements, such as capacity trading, may be the answer until such time as infrastructure is expanded efficiently.

## CASE STUDY

### FACILITATING GROWTH IN QUEENSLAND'S COAL INDUSTRY

In response to increased demand for Queensland coal overseas, and subsequent increased production, the Queensland government has pursued an aggressive program of investment to augment the state's coal infrastructure network.

Metallurgical coal production, which accounts for around 70 per cent of coal produced in Queensland, rose following unprecedented increases in coal prices in the early 2000s. For example, in 2004–05 the average export price of coking coal, in \$A terms, rose by 46 per cent (Department of Natural Resources, Mines and Water, 2006).

Most coal produced in Queensland is exported overseas. Accordingly, the efficiency of the coal supply chain is critical to the cost, and hence international competitiveness of Queensland's coal exports.

Increased demand and subsequent supply of coal has increased demand for services in all parts of the coal supply chain, causing congestion in some areas of the network. Concerns rose about the capacity of Queensland's coal infrastructure network to meet growth in demand following congestion in port infrastructure, which highlighted network inefficiencies.

In 2005, the Exports and Infrastructure Taskforce commissioned by the Prime Minister acknowledged these bottlenecks and noted that these blockages are likely to develop over the next five to ten years in the absence of decisive policy action. Unless addressed, these bottlenecks are likely to further constrain exports, given that demand and production is not forecast to substantially soften. The Australian Bureau of Agricultural and Resource Economics (ABARE) forecasts that demand for coal will rise over the medium term by an average of 2.7 per cent per annum over the period from 2005 to 2025, to 395 million tonnes in 2025.

Increased demand from Asia, particularly China, India and ASEAN for Queensland's high-quality metallurgical exports is forecast to contribute to boosting Australia's share of the global export market. Australia is projected to increase its share of the traded global coal market to 36 per cent in 2025 from 30 per cent in 2005.

ABARE notes that while coal producers have the ability to meet current and expected future demand for Australian coal, the ability of individual coal producers to meet

potential demand will be subject to their production costs, an appropriate market price and importantly, unconstrained access to export infrastructure.

ABARE notes that in addition to transport and port infrastructure, access to water resources and skilled labour will also be important in ensuring that Australia's coal export potential is realised over the longer term.

In response to increased demand for coal exports, and given the bottlenecks that have emerged in Queensland's coal network, the Queensland government has committed to an extensive program of investment in rail and port infrastructure to facilitate growth in the industry. Royalties, charged on an ad valorem basis, have provided the state government with a significant source of revenue, and growth in the industry has generated employment opportunities, particularly in regional areas of the state.

The infrastructure program announced by the state government will increase the capacity of Queensland's coal infrastructure network to 235 million tonnes per annum by 2010, at an estimated cost of around \$3 billion to \$4 billion. Despite this, given lags in planning and constructing infrastructure, in the short term capacity constraints are likely to negatively impact on coal exports. For example, in the Central Bowen Basin, ABARE forecasts capacity constraints to continue in the short term, although congestion should ease as capacity comes online some time between 2007 and 2012.

**TABLE 7: TRANSPORT REQUIREMENTS FOR EXPORTS OUT OF THE CENTRAL BOWEN BASIN**

	2005 Mt	2007 Mt	2012 Mt	2017 Mt	2022 Mt
Infrastructure required	90	108	120	132	150
Infrastructure capacity					
Ports	89	106	142	142	171
Track	92	116	142	142	177
Excess (shortfall)	(1)	(2)	22	10	27

Note: Includes Stage 2 of Abbott Point and the Northern Missing Link.

Source: Fairhead et al. 2006.

Similarly, ABARE forecasts constraints in the Southern Bowen system in the near term, although these are expected to dissipate as capacity comes online in 2007. However, by 2022 capacity in the system is expected to exceed that required to facilitate exports by 39 million tonnes.

**TABLE 8: TRANSPORT REQUIREMENT FOR EXPORTS OUT OF THE SOUTHERN BOWEN BASIN**

	2005	2007	2012	2017	2022
	Mt	Mt	Mt	Mt	Mt
Infrastructure required	49	57	77	90	95
Infrastructure capacity					
Ports	47	74	96	145	145
Track	50	61	81	101	134
Excess (shortfall)	(1)	4	4	11	39

Note: Includes upgrade associated with Southern Missing Link.

Source: Fairhead et al. 2006.

Given the high level of funding required to support further industry growth, the benefits and costs, including the risks to the state of augmenting supply, should be considered.

Although there are clear benefits to the state economy from augmenting supply, and the cost of some of this infrastructure will be recovered from users, the state is exposed to the risk that capacity in the system may remain unutilised over the medium term. ABARE's work suggests that in the medium term there is likely to be significant idle capacity in these networks. Capacity in the Central and Southern Bowen Basins is expected to exceed that required by 27 Mt and 39 Mt respectively in 2022. For instance, by 2022 excess capacity in the Southern Bowen Basin network is expected to reach almost 30 per cent.

Given the lags associated with infrastructure investment, further augmentation in the network is required to facilitate future export growth. However, if economic growth in key export destinations softens, or if coal prices fall, further capacity in the system is likely to remain unutilised – representing an opportunity cost for scarce public funds.

Accordingly, the government should aim to minimise the risks of over- and under-utilisation. For example, to the extent possible, expenditure in infrastructure projects could be staged to mitigate the potential impact of under-utilising infrastructure. Progressive assessments during the construction of early stages of the project should include a reassessment of demand and risks associated with constructing the infrastructure, particularly where the public retains the downside risk of under-utilisation. Accordingly, these risks should be managed to ensure maximum net benefits are accrued from public investment in coal infrastructure.

In addition, potential investments in the coal industry should be examined with consideration given to opportunities for investment elsewhere in the economy, to

ensure that public funds are utilised effectively by investing in projects that are anticipated to yield the greatest benefit to society.

Consideration could also be afforded as how investment in the sector could also be facilitated using private sector funding. As noted by Xstrata in its submission to the Prime Minister's Export and Infrastructure Taskforce,

*There is no need for government investment support [in relation to constraints on coal exports] as capacity restrictions do not result from a difficulty in obtaining private sector funding. The coal industry/private sector is quite capable of raising the funds required for properly underwritten projects so long as the regulatory and investment rules are clear.*

Given that the public sector has historically provided this type of infrastructure, and given the nature of investment and that many of these providers are monopolies, private sector involvement may require facilitation by the public sector. Accordingly, governments should examine opportunities for partnering with the private sector in providing infrastructure to mitigate some of the public risk associated with investing in these types of projects, including capacity issues.

## Section 3: A sustainability framework

### Key Points

- The focus currently in Queensland is on the delivery of a significant infrastructure program.
- The consequences of that program from a sustainability perspective are therefore almost entirely set.
- The issues in the near term will not centre on project prioritisation and need, but rather on issues of risk allocation, procurement, funding and pricing.
- There are steps that can be taken to mitigate some of the risks that may currently exist. There is an opportunity to reset infrastructure policy when the pressure of delivery reduces.

### Introduction

Sustainably managing Queensland's infrastructure through the appropriate pricing, funding and prioritisation frameworks is important to ensure that society maximises the benefits that accrue from investing in key social and economic infrastructure.

Recent debate on infrastructure has focused on the need for delivery. However, the Queensland government is in a unique position to have a significant impact on the economic prosperity of current and future generations through the investment choices it makes as part of its sizable infrastructure program. There are steps that can be taken to mitigate some of the risks in the current program, and more importantly reset the infrastructure policy framework when the pressure of delivery reduces.

### Elements of a policy framework

Many of the elements that would be expected to form a sustainability framework exist now but are not integrated into a single policy framework.

If a sustainability framework was to be developed it would be expected to have features such as:

- a rigorous project evaluation framework with provision for regular project reviews, but with a triple bottom line or similar focus;
- a project monitoring and assurance framework to track the progress in the implementation of projects and any specific project risks;

- the provision of infrastructure services, where possible on commercial terms, ensuring that prices reflect the full cost of services and, where possible, are provided in a competitive environment;
- allocation of risks from infrastructure development to entities best placed to spread and bear those risks;
- implementation of remedies for market failures and externalities; and
- performance indicators, reflecting quality of service and user satisfaction, not just measures of asset value and finance.

These issues are explored in more detail below, along with further discussion on how some of the weaknesses in the current framework can be addressed.

### PROJECT PRIORITISATION

#### *Institutional/policy settings*

As discussed in Section 2, the concept of sustainability is one that requires a long-term, intergenerational and holistic perspective be taken on infrastructure investment. The Project Assurance Framework adopted by the Queensland government has a 'value for money' focus. From a sustainability perspective it is important that this framework explores in detail the linkages between infrastructure and economic, financial, environmental and social issues.

In order to make such a framework work effectively, it needs to be complemented by a similarly focused institutional structure. Currently with its focus on infrastructure delivery the Department of Infrastructure has a key role to play. However, infrastructure is not an end in itself, but rather a means to an end. Therefore, infrastructure policy needs to be tied into other policy initiatives. For example, policy to shape water infrastructure would form part of a sustainable water strategy but would be linked to other strategies in the water sector. In this way non-infrastructure solutions may be found for infrastructure problems.

Having physical infrastructure strategies linked to broader and higher level strategies is consistent with the view that physical infrastructure contributes to a range of objectives – economic, social and environmental. While the current focus in Queensland is very much on infrastructure delivery, the economic role and significance of infrastructure should not take precedence over other dimensions of sustainable economic development – the social and environmental aspects.

While sectoral strategies establish the strategic directions for infrastructure in the sector, infrastructure policy can answer questions in relation to delivery, such as:

- the type of infrastructure;
- how much infrastructure;
- when to construct; and
- who pays.

#### *Project reviews*

As discussed in this paper, there is considerable cost pressure within the construction industry meaning that infrastructure projects are consuming even more resources, such that:

- the underlying economics, and therefore benefits, of projects will potentially reduce; and
- the relative merits of projects may change.

This environment creates a need for regular scrutiny and review of projects within the Project Assurance Framework.

#### PROCUREMENT

The cost pressures that are being seen in the construction industry are driven by market forces and therefore cannot be largely influenced by the government. However, there are a number of initiatives which can be implemented which may have an impact in the medium to long term.

#### *Scope for increased competition in the contracting market*

Given the structure of the Australian contracting market, the government's ability to facilitate increased competition may be limited to:

- encouraging international companies to compete for work in the domestic marketplace; or
- packaging prospective work in such a way that smaller contractors can be competitive in tendering for work.

In respect to the first point, obviously the size of the Queensland market will limit its attractiveness to international firms. There is an emerging, relatively large, privately funded infrastructure market in the United States that would be more attractive than the market available in Queensland, or for that matter, Australia. This, coupled with having to establish a skilled labour force when there is a labour shortage and the uneven pace at which

projects come on to the market, will limit competition.

A further concern are bid costs, where the bidding requirements can be seen to be more onerous in Australia than other jurisdictions.

#### *Addressing tender process issues*

The government should continue to apply a robust procurement options assessment to each of its major infrastructure projects such that the most appropriate route is selected for project delivery in each case. Currently this is done with a range of projects being undertaken by traditional methods, some by PPPs and others via alliance or other 'hybrid' contracting approaches.

Other issues that the government may wish to consider include:

- appointing appropriately skilled and empowered people to run and contract manage major projects, establishing central knowledge units to ensure efficiencies and lessons learnt from past projects are brought to bear in future projects;
- consideration of the amount of external work (i.e. surveys, studies, etc) or data that can be provided up front (including the clarity of how the government specifies its requirements) to bidders to allow more informed pricing of the project and their risks;
- ensuring procurement processes include open and transparent engagement with bidders to articulate requirements and expectations and allow a dialogue on key issues in advance of bid submission;
- consideration of the appropriate length of fixed bid price validity periods to avoid significant (and sometimes unnecessary) pricing premiums for escalation;
- acknowledgement of the sensitivity for contractors around absorbing bid costs where they are unsuccessful in tenders and focusing on requesting the correct level of information sufficient only to complete a robust evaluation and selection of a preferred bidder; and
- demonstrating strong management of user groups and key stakeholders, particularly in relation to consultation and involvement in the design development phase, such that the private sector can be assured they will not get stuck in a cycle of review and comment before they can begin construction work.

Clearly each of the initiatives outlined above are already on the government's agenda and have been evidenced in many tenders to date. However, consistent application is the key to fostering an efficient and effective infrastructure market. This would potentially mitigate, to some degree, ongoing exposure to real construction costs escalation.

### *Increasing training*

The government is seeking to help mitigate the skills shortage by increasing and improving vocational training in core trades. This is a longer term solution, given the length of time required to attain accreditation or complete apprenticeships.

One of the big issues associated with increasing training is that with a highly mobile workforce the trained talent is likely to move to wherever they can attract the highest pay, which will not necessarily solve the problem of a skills shortage in any one state. In effect, this calls for either a federal initiative (such as the recently announced \$837 m Building Skills for the Future reform package (Morris 2006)).

### MONITORING AND REPORTING

By definition, issues of sustainability are focused on more than financial matters. The evaluation framework takes into account wider economic issues and, similarly, it would be expected that the reporting framework would do likewise.

There is an increasing trend and demand for organisations to demonstrate transparency and accountability beyond the domains of financial performance. Decision-making along triple bottom line (TBL) is becoming an accepted approach in implementing the intangible concept of sustainability.

TBL reporting is a concept that serves to demonstrate an entity's approach to managing one or more of the economic, environmental and social dimensions of its performance.

A sustainable position would be one where there would be no uncompensated negative impacts on one of the triple bottom lines. Therefore, the economic and financial impact of infrastructure should not take precedence over the other dimensions – the social and environmental aspects. On the one hand the positive impact of infrastructure provision needs to be taken into account, but equally, the impact of under-provision or over-provision of infrastructure also needs to be considered and reported.

## Conclusion

In summary, there are a number of basic principles that would support a sustainable infrastructure policy framework:

- The long-term impact of infrastructure investment decisions must be evaluated. A key risk of infrastructure investment is that there are long lead times for any adjustment in capacity to reflect changes in demand. If a long-term view is not taken the risk is that the focus will be on short-term costs not longer term solutions.
- Project prioritisation decisions must be made on the basis of comprehensive information encompassing financial, economic, social and environmental parameters.
- Infrastructure solutions need to be sought that advance more than one issue, for example, solutions that provide improve efficiency, social outcomes and the environment.
- Key risks in project delivery need to be identified and allocated to the party in the best position to manage those risks.
- Competition should be facilitated where possible in the delivery of infrastructure.
- It must be ensured that there are no distortions in setting prices for infrastructure services. Facilitate competitive outcomes in prices through effective regulation. Ensure that there is consistency of regulatory oversight in the infrastructure sector.
- In facilitating market-focused outcomes, corrections need to be made for explicit market failures such as externalities.
- A monitoring environment needs to be created that focuses on the risks and outcomes in delivering projects.

The need for greater infrastructure investment is demonstrably clear, but so is the need to sustainably manage infrastructure investment. The government's success in infrastructure provision should not be measured just by the quantum of funds invested but how infrastructure contributes to economic growth and other economic and social objectives.

Achieving this outcome is a challenge that is not unique to the Queensland government. Uncertainty, scarcity in the availability of funds for investment and competing priorities present challenges to all governments in infrastructure planning and delivery. The issues that need to be considered extend beyond increasing the amount of investment in infrastructure and include the price of infrastructure services, project prioritisation, project funding, and

creation of mechanisms to ensure efficient utilisation of infrastructure.

The Queensland government is addressing the need for further investment in key economic and social infrastructure in Queensland through strategies such as the South East Queensland Infrastructure Plan and Program. Given that the quantum of funds invested as part of these programs is expected to exceed that invested in recent history, there is a strong responsibility to ensure that scarce public funds are invested optimally.

## Appendix 1: Queensland Infrastructure Stocktake

### Introduction

Up until recently the debate in Queensland has centred on the lack of infrastructure development. However, recently Access Economics (2006) noted that Queensland has the second largest pipeline of economic infrastructure projects of any Australian state or territory. Only WA, itself riding the wave of the current boom in the mining sector has a larger infrastructure program. In 2007, the Queensland government is forecasting to spend a record \$11.6 billion on infrastructure across the state, the largest building program in the nation, per head of population.

The current infrastructure program has two geographic foci – one for south-east Queensland and one for regional Queensland.

### Project highlights – South-east Queensland infrastructure

Some years ago, the Queensland government introduced a rolling program of infrastructure investment priorities, published annually in the SEQIPP. The program aims to give 'direction and momentum' to the infrastructure initiatives the Queensland government will focus on over the next 20 years. The plan is intended to be a dynamic document, updated annually by the state government.

The current 2006 plan commits towards \$66 billion in infrastructure projects over the next 20 years, including almost \$28 billion in road and public transport projects, \$90 million to investigate another possible \$14 billion worth of road and public transport projects, and \$5 billion in social and community infrastructure.

It also includes an expected \$5 billion in water infrastructure projects – excluding the two new south-east Queensland dams and connecting infrastructure – plus \$4 billion on energy networks over the next five years and \$10 billion in expected outlays on energy networks beyond the first five years.

There are around 350 projects in the 2006 plan compared to 230 in the 2005 plan, an increase of around \$11 billion or 20 per cent on the investment outlined in the 2005 plan.

### WATER INFRASTRUCTURE

In percentage terms, the government's investment in renewing and creating water infrastructure shows the most marked difference between the 2006 and previous plans, with an increase in the state government's investment of more than 50 per cent.

The plan foreshadows the creation of two new dams, the institution of a western corridor recycled water scheme, the construction of the Cedar Grove weir, a number of water distribution projects (including the southern regional water pipeline), and investigation of alternative water sources such as desalination and groundwater. The plan states that a number of water programs will be accelerated in light of the length of the drought currently affecting Queensland.

The key projects include:

- Gold Coast desalination plant;
- Southern Regional water pipeline; and
- Western Corridor recycled water project.

The Gold Coast Desalination Project is a joint initiative between Gold Coast City Council and the state government. It is part of Council's Gold Coast Waterfuture Strategy and the state's South East Queensland Regional Drought Strategy Contingency Supply Plan. The project is a critical element of future water supply planning, as it does not rely on climatic conditions. The Gold Coast Desalination facility will be connected to the SEQ Water Grid, which will provide a network of two-way pipelines to connect all major bulk water sources in the region.

Construction commenced in September 2006 when the desalination plant was commissioned to be completed by the end of November 2008. Council and the state government have jointly committed \$100 million in funding. The total project cost is estimated to be approximately \$1.1 billion.

The Southern Regional Water Pipeline (SRWP) is a regional infrastructure project of key importance designed to help Brisbane City, Ipswich City, Logan City, Gold Coast City and Beaudesert Shire councils manage their existing and long-term potable water requirements.

The pipeline sources water from across south-east Queensland. It will take the combined water from Wivenhoe Dam, Hinze Dam, the Tugun desalination plant, and other water sources. The estimated project cost is \$680 m.

Construction of the pipeline and related infrastructure started in October 2006. Construction will be completed in 2008. The pipeline will be able to incorporate new water sources, such as Wyaralong Dam and Cedar Grove Weir into this network when completed.

The Southern Regional Water Pipeline Company is also assisting the Coordinator General to find a proposed route for the Northern Pipeline Interconnector Project. This project will meet emergency drought regulations linking Brisbane with the Sunshine Coast. When completed, the new pipeline will have the capacity to move surplus water between Brisbane, Caboolture and the Sunshine Coast.

The Western Corridor Recycled Water (WCRW) Project is the largest recycled water scheme to be constructed in Australia and will be the largest project of its kind in the southern hemisphere. It will involve building a pipeline from six wastewater treatment plants in Brisbane and Ipswich to take recycled water to industry and agriculture. Construction will be split into two stages, with the project scheduled for completion in 2008.

The two stages of the project, will involve:

- taking recycled water from treatment plants at Oxley, Wacol, Goodna and Bundamba to supply power stations at Swanbank and Tarong; and
- linking the Luggage Point and Gibson Island treatment plants to the pipeline and allowing larger volumes of water to be supplied.

In March 2006, a consortium of GHD Pty Ltd, Black & Veatch and Sunwater was awarded the tender for the design and pre-construction work for Stage 1 and 2 of the project. Government funding of \$100 million was announced in April 2006 for an initial order of pipes and materials for the first stage of the project.

The Coordinator-General is responsible for the management of the WCRW Project.

## TRANSPORT INFRASTRUCTURE

The plan focuses on road infrastructure, with an emphasis on orbital and bypass roads. Major upgrades are planned for the Ipswich and Gateway Motorways, and most road projects are earmarked for completion within the next ten years.

The scale of the planned works, along with the government's policy requiring consideration of PPP delivery of all projects (where the expected capital value will exceed \$30 million or the net present value of the strategic priority will exceed \$50 million during the contractual relationship) opens up the possibility for private sector investment over the next ten years. Importantly, the plan acknowledges that the scale of the projects may exceed the construction industry's current capacity.

Consistent with the objective of reinforcing the western region of south-east Queensland as a freight transport hub, the plan includes substantial rail network upgrades, as well as an upgrade of the Port of Brisbane. The plan also includes the Gateway Upgrade Project (including duplication of the existing Gateway Bridge) and foreshadows construction of the Tugun Bypass, as well as upgrades to the Pacific Motorway and Bruce Highway.

Although the plan's focus for the greater Brisbane area is on road infrastructure, for the Sunshine and Gold Coast regions it concentrates on substantial upgrades to current public transport systems and networks. The plan envisages the creation of 'trunk' or 'spine' public transport systems for both the Sunshine and Gold Coasts. The proposed projects include increasing the capacity of existing rail lines and creating new public transport corridors.

## EDUCATION AND HEALTH

Major projects planned or underway include:

- Burpengary West State School;
- Gold Coast Hospital;
- Prince Charles Hospital;
- Springfield Lakes State School; and
- Sunshine Coast Hospital.

## ENERGY INFRASTRUCTURE

In the energy context, the plan demonstrates a desire to diversify into new and varied sources of electricity generation. Consistent with the Queensland Energy Policy, the plan foreshadows a greater use of gas-fired power stations, opening up the possibility for this area of the electricity generation industry to assume a more active role.

## PROCUREMENT

A significant addition to the SEQIPP is a description of the methods the state government will adopt to fund the extensive infrastructure program. Although the plan envisages significant government funding for the bulk of the projects, it foreshadows increased private sector participation through PPP initiatives.

The Queensland government's 2006–2007 budget earmarks a number of projects as PPP candidates, including:

- the proposed Airport Link tunnel;
- the Toowoomba Bypass;
- the duplication of the Centenary Highway from the Ipswich Motorway at Springfield, and the construction of a rail line from Darra to Springfield;
- the Gold Coast Public Transport Project, which involves an upgrade of the Gold Coast public transport system;
- the Eastern Busway, extending from Buranda to Capalaba;
- a number of proposed schools on the Sunshine Coast and in the Western Corridor; and
- the Gold Coast Hospital.

A significant part of Queensland's infrastructure demands will need to be funded by the private sector. In response to this the state government has confirmed that it will continue to utilise PPPs as a form of project delivery, provided value for money can be demonstrated.

### **Project highlights – regional infrastructure**

Of the \$11.6 billion to will be spent on infrastructure across the state in 2007, approximately \$4.2 billion is dedicated to projects across regional Queensland. These projects focus on expanding and upgrading water, roads, ports, education and training, rail, health and energy infrastructure.

## FAR NORTH QUEENSLAND REGION

The key infrastructure projects in Far North Queensland involve upgrading hospitals and health care facilities, building new schools, expanding roads and redeveloping Cairns Airport.

- The government is spending \$131 million improving hospitals and primary health care centres in Far North Queensland.
- Nine projects focus on delivering improvements in health care and emergency services for people in the region, including:
  - redevelopment of Innisfail Hospital, currently under construction at a cost of nearly \$42 million;
  - \$11 million expansion of Cairns Hospital, providing 12 extra beds and an upgrade of the Emergency Department;
  - redevelopment of Weipa Hospital at a cost of \$28 million;
  - building the \$13.4 million Hope Vale Primary Health Care Centre; and
  - spending \$12.9 million on two primary health care centres in the Torres Strait, and renal services on Thursday Island.
- The Queensland government is contributing more than \$17 million to build two new schools, in a joint project with the Australian government:
  - The first stage of the \$16.4 million Redlynch State College will provide a new secondary campus for up to 240 students in years 7 and 8. The first stage is due to be completed in January 2007, with construction on a school hall starting in 2007.
  - Isabella State School at Edmonton is due to be completed in time for the 2007 school year, providing a new primary school for up to 190 students.
- The government is spending nearly \$4.8 million on a third education project, new buildings for preschool to year 6 students at Kuranda, with space for up to 610 students. Construction is due to be completed in January 2007.
- The \$180 million redevelopment of Cairns Airport is under way: \$140 million will be spent on a major redevelopment of the domestic terminal, with a further \$40 million for the international terminal, expanding the arrivals hall and upgrading retail areas.

## NORTH QUEENSLAND REGION

Key infrastructure projects include upgrading roads, redeveloping hospitals and supporting infrastructure for the coal industry:

- The government is spending \$87.5 million on 100 extra beds and a birthing centre for Townsville Hospital. Construction on the \$22 million Ingham Hospital and \$10.5 million redevelopment of Collinsville Hospital will begin in 2007.
- The Abbot Point Coal Terminal Expansion is under way. This project will double the size of the existing stockpile area and increase terminal capacity from 15 million tonnes per year to 21 million tonnes per year. The Coordinator-General has also completed an Environmental Impact Statement report on the Northern Missing Link, a rail freight link from North Goonyella to Newlands, estimated to cost \$765 million.
- The government is spending more than \$26 million on the Townsville Trade Campus, a new special purpose trade training campus. Construction is expected to begin in late 2007, to enable completion by late 2008.
- The government has committed \$15 million towards the proposed Townsville Ocean Terminal. The \$1 billion project includes an ocean terminal for cruise and military ships, located on the Western Breakwater, and nearly 80 hectares of residential development on reclaimed land.

## CENTRAL QUEENSLAND REGION

Key infrastructure projects in central Queensland focus on health, education, road and rail infrastructure:

- The government is spending more than \$60 million on the Rockhampton Hospital Improvement Project to create an additional 30 beds and build a new Emergency Department.
- The 2007 redevelopment of the Yeppoon Hospital will see the replacement of the existing hospital and community health facilities.
- The \$1.7 million Mackay Hospital Clinical Resources Annex is currently being built, part of \$7.4 million of improvements at the hospital.
- A \$14.75 million project consolidating Gladstone's community, mental and oral health services is currently being constructed, and the \$8.6 million Gin Gin Health Service is due to begin construction in February 2007.
- Construction of the \$16 million Yeppoon Western

Bypass Road is on schedule and should be completed in June 2007. The bypass will improve safety for motorists in the centre of Yeppoon and remove heavy vehicles from the CBD.

- Planning and construction is underway for the upgrade of the Dawson Highway between Gladstone and Banana, a \$64 million project. The project, part of the Accelerated Road Rehabilitation Program, will widen 71 km of the Dawson Highway, and also replace seven timber bridges between Calliope and Rolleston.
- The government is helping to develop the skilled workforce in Central Queensland, spending more than \$37 million on development of a special purpose trade training campus in Mackay.
- The government is also spending nearly \$1.4 million on the Central Queensland Institute of TAFE at Yeppoon, a joint project with the Australian government.
- The government has signed an agreement with the consortium investigating the Surat Basin Railway (formerly the Dawson Valley Railway). The project, estimated at over \$1 billion, will build the "southern missing link" – a new 207 kilometre rail line from Wandoan to Banana.
- The government is building the infrastructure to enhance water supplies to the coal mines and communities of the Bowen Basin. The third Moranbah water pipeline project is currently under way, constructing a 70 km southern pipeline from Moranbah to the Dysart area. The project is the final part of a \$300 million infrastructure project to provide a secure and reliable water source for mining development in the northern Bowen Basin. The government has allocated more than \$56 million towards the Connors River Dam, as well as \$60 million for related pipeline developments. The dam will provide water to industry and urban and rural users in the northern Bowen Basin, and create an estimated 150 jobs during construction.

## WIDE BAY REGION

Major projects are underway in the Wide Bay region, or currently being planned, to deliver improvements in the region's roads, hospitals, health services and rail freight infrastructure:

- The government is spending more than \$73 million on five projects to expand and upgrade infrastructure for the health system in the Wide Bay region.
  - The \$6.7 million upgrade to the Gympie Hospital Emergency Department is under

construction. The project is expected to be completed in August 2007;

- Planning is underway for a \$41 million upgrade of the Bundaberg Hospital, and the hospital's new \$1.75 million electrical system is currently being constructed;
- To the north, a \$14.75 million project consolidating Gladstone's community, mental and oral health services is currently being constructed, and the \$8.6 million Gin Gin Health Service is due to begin construction in February 2007.
- Planning and construction is underway for the upgrade of the Dawson Highway between Gladstone and Banana, a \$64 million project. The project, part of the Accelerated Road Rehabilitation Program, will widen 71 km of the Dawson Highway, and also replace seven timber bridges between Calliope and Rolleston.
- The government is planning to duplicate and upgrade sections of the busy Maryborough–Hervey Bay Road. This \$25.6 million project will see stretches of the road widened to four lanes.

#### WESTERN QUEENSLAND

Key infrastructure projects will deliver improved roads and projects about to commence will upgrade health services and educational facilities:

- The government is contributing over \$1.2 million towards the \$3.1 million relocation of the automotive training facilities for the Toowoomba campus of the Southern Queensland Institute of TAFE.
- Construction of the Dalby Hospital upgrade will begin in February 2007, with the \$9.7 million project improving outpatient services, maternity and the emergency department.
- The \$11.7 million complete redevelopment of Miles Hospital will begin construction in April 2007, improving health services at the hospital.
- The \$33 million expansion of the New England Highway is currently under way. The project is expanding the highway to four lanes through Highfields, north of Toowoomba, along with a program of widening, overtaking lanes and intersection improvements north to Crows Nest. The first stage has already delivered four lanes of highway from Highfields Road to Borghardt Road.
- The next stage through to Reis Road is currently out to tender. Construction is expected to begin in March/April 2007 and be completed by end of

2007. The final stages of the project are due to be completed by the end of 2009.

- Ruthven Street, Toowoomba, will also be upgraded between January 2007 and the end of 2009, in a \$25 million project in conjunction with Toowoomba City Council. The project will see upgrades to traffic signals and intersections, and the widening of a section of Spring Street.
- The government is building infrastructure to meet the rising need for power for regional industry and communities, including expected spending of almost \$360 million on the continuing development of the Kogan Creek Power Station and coal mine.

#### EXPORT COAL INFRASTRUCTURE

The Coordinator-General has established a Coal Taskforce to ensure Queensland's coal infrastructure (coal rail, port, water, skills and housing) can support the production and export of Queensland's coal. The Taskforce will work with infrastructure owners and users to ensure that impediments to development are identified and practical solutions adopted.

In May 2005, the government released a \$4.2 billion Coal Infrastructure Program of Actions, which includes provision for detailed planning for approximately \$2 billion worth of coal-related infrastructure over and above the \$2.3 billion in infrastructure investments already committed.

Infrastructure development is subject to coal companies entering into commercial contracts with the infrastructure owners.

The Coal Infrastructure Program of Actions includes:

- completion of currently committed coal infrastructure investment by government-owned trading enterprises, including:
  - the Burdekin Water Pipeline
  - RG Tanna, Barney Point and Abbott Point Coal Terminals expansion
  - upgrades to Blackwater and Goonyella Rail Systems
  - electricity to new mines
  - acquisition of additional rollingstock and upgrade of electric locomotives
  - construction of other coal rail and port infrastructure.

- Detailed planning for over \$1 billion of new infrastructure, including:
  - further capacity upgrades to the Goonyella, Blackwater and Moura Coal Rail;
  - systems to match port capacity (subject to commercial arrangements with users);
  - Ergon Energy to work with mining companies to clarify electricity needs and develop a commercial program to provide power to new or expanded mine sites at the earliest possible time.
- Further expansion of coal terminals and our ports at Gladstone and Abbot Point.
- Facilitating the expansion of the two major coal terminals at Hay Point by their private sector owners, BBI and the BHP-Billiton Mitsubishi Alliance.
- Fast-Track Planning for the \$1.1 Billion Northern Missing Rail Link / Abbot Point Coal Terminal.
- Wiggins Island Coal Terminal and associated port and rail infrastructure at the Port of Gladstone. Detailed planning has commenced with development subject to future demand.
- Identification (where needed) and more detailed planning for long-term water security options in the Bowen Basin (in particular a potential water storage on the Connors River) and the Surat Basin.
- Evaluation of additional rail capacity enhancements, particularly to the Goonyella Rail System and the restricted Connors Range section, linking to the coal terminals at the Port of Hay Point.
- Transport options for the major coal deposits in the Surat Basin.

Expansion in port and rail capacity is seen to be critical in supporting the coal industry.

The Ports Corporation of Queensland is developing a \$430 million Stage 3 expansion of its coal export terminal at Abbot Point, 25 km north-west of Bowen. The Stage 3 expansion would effectively duplicate the existing terminal infrastructure.

The project is associated with the proposed Goonyella to Newlands rail line and would increase the coal handling throughput of Abbot Point from its Stage 2 capacity of 25 million tonnes per annum to 50 million tonnes per annum. The construction workforce would peak at approximately 950 people. Approximately 50 additional permanent jobs would be created by the project at full capacity.

Queensland Rail is proposing to construct and operate a 69 km rail link between the North Goonyella and Newlands rail systems in the northern Bowen Basin coalfields. The rail link, commonly referred to as the Northern Missing Link, will connect near the existing mines of North Goonyella and Newlands and would allow coal trains originating in Central Queensland to be directed to the port of Abbot Point, near Bowen.

Initially, the line would utilise diesel locomotives, however plans for subsequent electrification are being considered. The rail corridor would be 40 m to 60 m wide and include at least three passing loops. In addition, the project will require upgraded facilities along the Newlands to Abbot Point rail line. Including electrification, the total project cost is estimated to be \$765 million.

The Central Queensland Ports Authority (CQPA) is currently expanding the capacity of the coal terminal in the Port of Gladstone to upgrade it to a capacity of 70 Mtpa.

Terminal development includes a stockyard with stacking and reclaiming conveyors and machines, outloading conveyors and three shiploaders. Marine works include reclamation of intertidal areas adjacent to Hanson Road, which are proposed to be bunded and infilled with dredge material, a 2 km jetty structure, wharf (six berths), independent berthing and mooring structures and dredging from the Targinnie Channel to the new berth.

Construction and operation of electrified rail access to and from the new terminal, both from the north and from the south, is also proposed, together with supporting infrastructure, including holding yards, train provisioning and rollingstock maintenance facilities. This rail access will have an ultimate capacity to transport 70 Mtpa to the new terminal, with the first stage having sufficient tracks for 25 Mtpa and be able to be expanded to second and third rail receipt and ship loader streams.

Construction on the first stage is anticipated to commence Q4 2007, with completion Q3 2010.

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## Endnotes

1 infrastructure expenditure is defined as the sum of private new engineering construction, public corporations gross fixed capital formation and general government gross fixed capital formation.

# 4 Private Capital Finance

BY STEPHEN WALSH AND IAN MACOUN, WITH JASON WATTERS, JENNY COSGROVE, NATHAN LEAD, IAN MITCHELL, DR MICHAEL REGAN AND DR RICHARD COPP.

## Introduction

Will Queensland be able to marshal sufficient private capital to fund its future infrastructure needs?

Queensland has a huge infrastructure task ahead – starting now, and continuing for at least 10–20 years. The state is growing rapidly and there is a big job to be done.

A lot of investors – including individuals, institutional funds managers and superannuation funds – are looking to invest in infrastructure. Infrastructure has characteristics which make it desirable in a portfolio (particularly, diversification benefits); and around the world, including in Australia, capital is becoming available for investment in infrastructure assets.

At the same time, much of the world has extensive infrastructure construction and asset sales planned. Queensland will have to compete with other governments, both Australian and overseas, (and with the secondary infrastructure asset market) for the available capital (large though it is). Australian capital and other resources can readily go overseas.

The key to the Queensland government accessing the capital and other resources it needs, and getting value for money, is to have an attractive enabling environment and transparent, efficient, competitive bidding processes.

Government has an important role to play; so does the private sector. They will have to work well together to get the job done and for the needs of both to be met.

## Executive Summary

### Chapter 1: Queensland's future infrastructure funding requirements

There is a very substantial requirement for future infrastructure investment in Australia. Bottom up estimates derived from existing state plans suggest that in the order of \$300bn will be required over the next 10 years. The final amount is likely to be between \$300–400b, and perhaps even higher.

Clearly, proposed expenditure of this magnitude raises questions about execution in practice (will it be possible to deliver all these projects in the context of physical capacity constraints in the planning and execution departments of state governments, as well in the construction industry?) and the appropriate mix of funding, including (in relation to both execution and funding) the issue of private participation.

With respect to Queensland, existing plans, such as SEQIPP and the SIP, have acknowledged the need for better longer term planning of Queensland's infrastructure requirements. Within these frameworks, the government has identified a very substantial programme of future works that will need to be completed. Given the duration of the planning period and the pace of growth, it would not be surprising if both the number and value of the required projects were to increase even further over time.

Within its near term budget, the State has flagged an intention to fund most of its requirements from debt. This has been its primary modus operandi historically. However, it has also indicated its willingness and indeed a need to consider private funding for appropriate projects.

### Chapter 2: What attracts the private sector to infrastructure?

Around the world there are large amounts of capital looking for acceptable investment opportunities. Global demographics, including an ageing

population saving for retirement, are driving this. Australia, with its rapidly growing superannuation funds, is no exception.

The scale of the demand for new infrastructure investment in Queensland, Australia and globally has created an opportunity for private sector investment, and infrastructure is fast becoming an asset class in its own right.

There are several major means whereby investors can make equity investments in infrastructure assets, including:

- listed securities;
- securities in unlisted investment vehicles; and
- direct ownership of a portion of the infrastructure assets.

Both individual and institutional investors are increasingly seeking to place large amounts into investments in infrastructure. Institutional investors, including institutional funds managers and large superannuation funds, are generating billions of dollars for investment in infrastructure.

Whilst there are some differences between the needs and motivations of the different types of investors, the fundamental attractive characteristics of infrastructure underlie its attractiveness to investors generally as a special investment asset class.

These include:

- low volatility of returns;
- returns exhibit low correlations with those of other sectors and other asset classes, and so infrastructure investments provide substantial diversification benefits in portfolios;
- inflation indexed cash flows;
- long dated assets to match their portfolio of long dated liabilities (especially superannuation funds); and
- attractive investment returns to date, especially in certain macro-economic circumstances (falling interest rates) where dividend yield is favoured; and as the virtues of the asset class have been discovered by growing numbers of investors bidding up the prices of limited existing infrastructure investment opportunities (investment demand has exceeded the supply of infrastructure securities available for investment).

However, going forward, we believe the competitive context may change, so that the above-average returns earned by early pioneers are competed away.

This should occur

- as the supply of infrastructure assets increases;
- as structuring skills circulate around the market and availability increases;
- as governments become more adept at creating a conducive enabling environment and running efficient competitive bidding processes;
- as both the government and the private sector (including institutional investors) become more experienced at working together in PPP projects and in understanding each others' needs.

Alternatively, we may see the development of various means of sharing returns between the public and private sectors. This is being achieved through a variety of approaches overseas. Some examples of this are described in Chapter Six and include the public sector taking a portion of windfall gains upon refinancing, and tenders calling for option values to cap the excess value capture by the private sector over the base value/return.

It may be that Queensland, which has undertaken fewer PPP projects to date than some other Australian states and overseas governments, will prove to have been advantaged in having avoided 'full-on' commitment to private sector participation during the 'pioneering' stage of the PPP phenomenon.

Queensland, having been in a relatively strong fiscal and economic position throughout the past decade, has been under no fiscal 'pressure' to undertake PPPs. However, now that private sector investment funding is becoming much more extensive and thus competitive, the timing may well be right to increase the PPP activity in Queensland. Queensland has the opportunity to learn from the experiences of the other states and overseas, to hone its skills and structures in creating a facilitative environment, and undertake PPPs under optimal ('win-win') conditions.

### Chapter 3: Private sector funding sources

A great deal of private sector capital is becoming available for investment specifically in infrastructure assets around the world. (Different capital providers often get involved in infrastructure projects at different stages of the project's maturity, depending on their own particular competence and requirements.)

At the same time there is clearly a major, and rapidly growing, demand for such capital by

governments throughout the world, with enormous infrastructure construction tasks ahead. Infrastructure has become a global industry.

Australia fits into this picture as both a supplier of capital, through our substantial superannuation and managed funds industry (the fourth largest in the world) and as a user of such capital, given the major infrastructure construction tasks ahead for the various Australian governments, including Queensland. Stating the obvious, there seems a major potential opportunity for the two groups – Australian governments and Australian superannuation and other institutional investors – to work together to achieve their mutually compatible goals. Each will need to understand the other's needs and be competitive relative to the other's alternative partners.

Queensland needs to have the ability to compete for the capital and other resources it needs in order to build its required infrastructure on favourable terms. A globalising supply and demand backdrop means the Queensland agencies will need to understand this complex scene and the participants it wants to work with (e.g. Australian super funds) and have as attractive an enabling environment for them as they will be offered in other states, or overseas, to mutual benefit – or the investors will deploy their money elsewhere.

Equally, Australian institutional investors must compete for the right to invest, and give government value for money.

#### **Chapter 4: Why should the public sector consider private participation?**

There are historic and compelling reasons why the public sector should fundamentally manage the process by which critical infrastructure is provided at state and national level.

A review of the various academic, regulatory and business studies performed on PPP's around the world (including in the UK, the USA, and Australia) in the last ten years highlights that private sector participation, if structured appropriately and to mutual benefit at the discussion/contract/tendering stages, offers potential benefits beyond the supply of an alternative funding source. These include:

- PPPs can result in significant cost savings;
- PPPs enable states to build projects sooner;

- cost and time savings from innovative project management;
- PPPs allow for the allocation of risk to the party best able to manage that risk;
- PPPs encourage innovations and incorporation of life cycle costs;
- access to the latest technology;
- better customer focus; and
- economically sound decision-making.

There are obviously some risks and challenges involved, but it is well worth the effort of addressing these.

#### **Chapter 5: Private sector participation –frameworks**

Public-Private Partnerships have many different forms and this section seeks to provide a broad overview of the range of models employed around the world. Form varies across asset procurement options, payment mechanisms, asset classes, etc. There is no one correct solution for all types of infrastructure projects and situations.

But all PPPs have similar objectives, namely:

- to allocate risks between public and private sectors to those parties best positioned to manage them;
- to increase cost savings resulting from improved procurement procedures and efficient service delivery;
- to enhance the quality of services delivered to the public;
- to generate reasonable profits to the private sector participants; and
- to free up government fiscal funds for use in other areas.

The government has, and always will have, an important role to play. At the same time, the private sector can make a major contribution, and there is a major 'win-win' for both the public and the private sector if the skills and capabilities of each can be harnessed by them working together in ways which play to the strengths of each.

Clarity of government requirements, an absence of undue complexity, and an attractive enabling environment will play a major role in bringing this about.

## Chapter 6: Private sector participation

If Queensland is to undertake the enormous task of ensuring that its infrastructure needs are met, and to obtain the benefits of private sector participation in this infrastructure challenge on favourable terms, it must create the right 'enabling environment' to generate private sector enthusiasm. This chapter outlines what it needs to do in order to accomplish this. This includes working strongly with, and getting to understand, the private sector groups with the capacity to participate.

In previous chapters we identified the strong desire and ability of private sector groups to invest in infrastructure.

Our conclusion is that there is an enormous potential 'win-win' for both the Queensland public and private sector participants (particularly Australian investors, and particularly superannuation funds), if the two groups can demonstrate a strong understanding of each others' needs. These investors have a strong appetite to invest, and government can obtain major benefits from such investment.

However, the market for the private sector supply of infrastructure is now a global one. And the need for infrastructure provision globally over coming years is enormous. So the Queensland public sector will need to compete strongly by making the state an attractive place in which to do infrastructure business.

And the private sector will need to work to understand the needs of the government and the public, particularly the need to demonstrate 'value for money', if it wishes the public to be enthusiastic about private sector involvement. There are ways in which the private sector and the public sector can work together to share the benefits of the resultant efficient provision of infrastructure.

## Chapter One

### Queensland's future infrastructure funding requirements

#### Summary

There is a very substantial requirement for future infrastructure investment in Australia. Bottom up estimates derived from existing state plans suggest that in the order of \$300bn will be required over the next 10 years. The final amount is likely to be between \$300–400b, and perhaps even higher.

Clearly, proposed expenditure of this magnitude raises questions about execution in practice (will it be possible to deliver all these projects in the context of physical capacity constraints in the planning and execution departments of state governments, as well in the construction industry?) and the appropriate mix of funding, including (in relation to both execution and funding) the issue of private participation.

With respect to Queensland, existing plans, such as SEQIPP and the SIP, have acknowledged the need for better longer term planning of Queensland's infrastructure requirements. Within these frameworks, the government has identified a very substantial programme of future works that will need to be completed. Given the duration of the planning period and the pace of growth, it would not be surprising if both the number and value of the required projects were to increase even further over time.

Within its near term budget, the State has flagged an intention to fund most of its requirements from debt. This has been its primary modus operandi historically. However, it has also indicated its willingness and indeed a need to consider private funding for appropriate projects.

#### The need for future investment

The state of the nation's infrastructure has come under scrutiny from leading research, peak industry body and policy groups suggesting that the country's existing infrastructure assets are unable to cope with the demands and growth of the economy. Developments such as increased road congestion in urban cities, long waiting times at ports in NSW and Queensland and issues concerning the sustained supply of water for urban and agricultural use have prompted a number of studies into the provision of essential infrastructure and the associated roles of the public and private sector.

The Australian Council for Infrastructure Development (AusCID), now Infrastructure Partnerships Australia (IPA); Access Economics; Committee for Economic Development Australia (CEDA); Business Council of Australia (BCA) and Engineers Australia have all produced research on the subject.

The Federal government entered into the debate with the Prime Minister commissioning an inquiry<sup>1</sup>, in March 2005, into whether infrastructure bottlenecks are hampering export growth, and if so, what can be done about it. The review concluded that parts of the nation's export infrastructure face immediate capacity constraints, but stopped short of describing them as a major crisis, given that the specific parts (i.e. coal loading facilities) were 'localised'. Clearly some of those problems remain. The Federal government has also focused on sustainable water supply, with the Commonwealth proposing, under the National Water Initiative ('NWI'), to take control of the Murray-Darling water basin from the States.

Infrastructure as a driver of economic growth, sustainability and international competitiveness has been a keen topic of many studies – for example, Aschauer (1989) and the World Bank (1994). The extent to which the various relevant Governments are implementing strategy and investing in much needed infrastructure is less clear.

The Business Council of Australia released its Infrastructure Action plan for Future Prosperity, in March 2005. The BCA's analysis highlighted a number of problems with respect to Australia's infrastructure, namely:

- there are numerous impediments to investment and efficiency in energy;
- all major cities are facing frustrating traffic congestion;
- there are many deficiencies in the national market for land transport;
- most cities face growing water shortages; and
- rural water supply is unreliable because the national rural water systems are under considerable stress (BCA 2006).

In an effort to progress the debate, the BCA implemented a benchmarking process to assess the extent to which major reform steps around structural change to Australia's infrastructure have been delivered by governments since the release of its March 2005 action plan. The BCA's view as at March 2006 was that solid progress was only seen at

the February 2006 Council of Australian Governments (COAG) meeting in which Federal, State and Territory Governments placed infrastructure reform at the centre of a renewed national reform agenda. Prior to that, there had been little substantive progress.

COAG has now assumed a major role in the coordination of national infrastructure as evidenced from its 2007 Policy Agenda<sup>2</sup>. If COAG is to be the catalyst for a national infrastructure reform policy then it will need to take the next step and execute on a number of its reform initiatives. The Allen Consulting Group has supported a COAG led approach and recommended the use of COAG as a catalyst for the development and implementation of a national infrastructure strategy<sup>3</sup>.

## Queensland's SEQ Infrastructure Plan and Program

The South East Queensland Infrastructure Plan and Program 2006 ('SEQIPP') identified A\$66bn in infrastructure projects to support the growing needs of the SEQ region. Infrastructure identified for development / rehabilitation includes economic infrastructure – road and rail, ports, and water, as well as social infrastructure – schools, hospitals and other community facilities. (it is worth noting that SEQIPP does not take into account expenditure outside South East Queensland, which is included in the State Infrastructure Plan (SIP) and the Blueprint for the Bush.)

SEQIPP 2006 notes that a number of projects have progressed since 2005. These include The Brisbane City Council North South Bypass Tunnel NSBT project (A\$2.9bn total project cost), which is an example of partnerships with the private sector. The project was funded by the private sector through bank debt and equity. NSBT listed on the ASX as RiverCity Motorway Ltd (ASX:RCY) with A\$691m raised in equity<sup>4</sup>. The project is scheduled for completion in October 2010.

In addition, "construction is well underway to establish a new Southbank Institute of Technology with completion scheduled for mid-2008. The project is a Public Private Partnership between TAFE Queensland and Axiom consortium." (SEQIPP 2006).

SEQIPP 2006 also identifies various projects for possible joint delivery with the private sector (see Table 1).

**TABLE 1: PROJECTS IDENTIFIED FOR POSSIBLE JOINT DELIVERY WITH THE PRIVATE SECTOR**

POSSIBLE PARTNERSHIPS WITH THE PRIVATE SECTOR	AMOUNT \$M	SEQIPP REFERENCE/SOURCE
Airport Link	1,300	p.26
Toowoomba Range Bypass	750	p.22
Darra to Springfield road and rail corridor		
Rail project	320	p.22, Office of Urban Mgt
Road project	470	p.22 Office of Urban Mgt
Gold Coast mass transit project	550	p.30, Office of Urban Mgt
Sunshine Coast schools	600	p.63
Western Corridor schools	500	p.63
Gold Coast hospital	530	p.61
<b>Total</b>	<b>\$5,020</b>	

Source: SEQIPP 2006, pg 11

**TABLE 2: CAPITAL FUNDING STRUCTURE – QLD STATE BUDGET ESTIMATES**

	2003–04 BUDGET \$ MILLION	2004–05 BUDGET \$ MILLION	2005–06 BUDGET \$ MILLION	2006–07 BUDGET \$ MILLION	4 YEAR CAGR
Total Capital Expenditure	5,273	6,049	7,981	10,136	24%
Less Capital Grants (Funded from Operating Revenue)	447	546	673	826	23%
Net State Capital Funding Task	4,826	5,503	7,308	9,310	24%
Funding Sources					
Cash Flows from Operating Activities	3,698	5,027	5,445	5,110	11%
Less Reinvestments	976	1,557	1,276	1,465	14%
Equals Net Cash Flow for Capital Acquisitions	2,722	3,270	4,169	3,645	10%
Asset Sales	272	335	323	351	9%
Borrowings	1,351	1,432	2,511	4,586	50%
Cash Balances and Other Financing Sources	481	266	305	728	15%
<b>Total Funding Sources</b>	<b>4,826</b>	<b>5,503</b>	<b>7,308</b>	<b>9,310</b>	<b>24%</b>
State Borrowings as % of Total Capex	25.62%	23.67%	31.46%	45.24%	
Total Capital Expenditure as % of GSP	3.64%	4.02%	5.15%	6.35%	
State Borrowings as % of GSP	0.93%	0.95%	1.62%	2.87%	

Source: Queensland Treasury, Budget Papers 2003–04 to 2006–07

However it is possible, even likely, that the private sector may be called up to deliver more than this. This is because:

- the overall investment required in SEQIPP could increase. This happened in 2006 – when the total estimated investment increased by \$5.1bn versus 2005;
- future projects not specifically identified at this point could be allocated to the Private Sector; and
- new infrastructure needs are likely to continue to emerge, given the rate at which the State is growing versus its peers.

## Queensland's capital expenditure budget

Capital investment in Queensland is budgeted to rise by 27 per cent to \$10.1bn in 2006–07. To fund this the Government will borrow \$4.6bn in 2006–07, including \$1.8bn in the general government sector and \$2.8bn for government-owned corporations. The willingness of the state to increase borrowing to finance its future infrastructure needs is clear.

### CAPITAL EXPENDITURE ALLOCATION

Table 2 shows State Budget Capital Allocations for the period 2004 – 2007.

Key Highlights from Table 2 include:

- Total capital expenditure increasing from A\$8.0bn for Budget 2005–06 to A\$10.1bn for Budget 2006–07 representing a 27 per cent year-on-year growth.
- Over the last four Budget periods, Total Capital Expenditure has been increasing at a Cumulative Annual Growth Rate of 24 per cent.
- The increased Capital Expenditure will be largely funded by State Government borrowings increasing from A\$2.5bn in 2005–06 to A\$4.6bn in 2006–07 – a net increase of A\$2.1bn.
- The growth in Capital Expenditure (27 per cent) far exceeds GSP growth for Budget 2006–07 reflecting the push by the Government to increase infrastructure investment.

## Inter-state comparisons

A number of Governments have responded to the call for future infrastructure by releasing their own infrastructure plans. These are generally up-dated on an annual basis. They include:

- **NSW** – A\$110bn over 10 years<sup>5</sup>. Funding will rely principally on budget funding and prudent

increased borrowing. Public– Private Partnerships will be used where appropriate with 10–15 per cent likely to be financed through the private sector;

- **Queensland** – South East Queensland Infrastructure Plan and Program ('SEQIPP') A\$66bn over 20 years, the Blueprint for the Bush indicates approximately \$36b of public and private investment already underway or under active consideration in Queensland to sustain and grow rural communities.<sup>6</sup>;
- **Victoria** – A\$12bn over 4 years<sup>7</sup>;
- **Western Australia** – estimated A\$97.5bn over 20 years or circa A\$50bn over 10 years<sup>8</sup>;
- **South Australia** – actual figures not specified but could amount to A\$6bn over 4 years<sup>9</sup>; and
- **Commonwealth Government** – through Auslink (Transport only) – A\$15bn to mid 2009<sup>10</sup>.

Based on the analysis displayed in Table 3 (page 58), which is derived from announced State Infrastructure Plans, total investment for Australia could represent at least A\$30bn annually.

However, this analysis is likely to prove conservative because announced plans are likely to under-state true requirements. For example, at the Commonwealth level, we have only identified AusLink in the preceding analysis. Secondly, Engineers Australia and AusCID are suggesting there is a A\$25bn backlog in infrastructure investment in water, energy and land transport and it is difficult to establish how much of this has been included and excluded from existing plans. A figure of this magnitude equates to almost 10 per cent of the total estimate provided above.

Finally, a cursory examination of the implied cumulative infrastructure investment over a 10-year period raises the question whether, over the period in which NSW has identified a need to invest \$110bn, \$30bn is going to be enough for Victoria. Much of the apparent inconsistency is probably accounted for by the duration of the plans and by the intrinsically 'lumpy' nature of infrastructure investment requirements.

## Broader estimates of future infrastructure requirements

The level of future infrastructure investment required to maintain and improve the nation's inventory – as opposed to what governments have announced as planned spend – has been considered by a number of commentators.

**TABLE 3: ANALYSIS OF ANNOUNCED STATE INFRASTRUCTURE PLANS**

STATE	PLANNED SPEND SB	PERIOD YEARS	ANNUAL SPEND (CALC)	10 YEAR CUMULATIVE SPEND (ASSUMED)	NOTES
<small>(ALL FIGURES IN AS BILLION)</small>					
NSW	110.0	10.0	11.0	110.0	Funding rely principally on public funds with 10-15% private
VIC	12.0	4.0	3.0	30.0	Historically c. 12% private sector funded
QLD – SEQIPP	66.0	20.0	3.3	33.0	Allocated to fast growing SEQ region per SEQIPP
QLD – Blueprint for Bus.	36.0	10.0	3.6	36.0	Sourced from Qld. State Budget Papers 2006-7
WA	97.5	20.0	4.9	48.8	WTM analysis of WA State Infrastructure Green Paper 2006
SA	6.0	4.0	1.5	15.0	Actual figures not specified est. on historical ABS data
AusLink	15.0	3.0	5.0	50.0	Comm. Govt (Land Only) to mid 2009
<b>Total</b>			<b>32.3</b>	<b>322.8</b>	

Source: State Infrastructure Plans, Public Data, WHTM Analysis

In sum, estimates suggest that the ultimate potential requirement for infrastructure investment could be as high as A\$400bn over the next decade.

Clearly, it is impossible to be definitive about the possible level of the private sector’s involvement in this very substantial workload. However, we can state some broad comparative parameters, viz. 10–15 per cent private sector participation levels to date for NSW, VIC and also the United Kingdom

It is possible that the levels we have seen to date, i.e. 10–15 per cent, may be surpassed in future. Infrastructure needs are constantly emerging, so it is more likely that the private sector will be considered for infrastructure procurement, particularly as the coming major increase in private infrastructure investment around the world demonstrates increasing VFM, as markets become deeper and more efficient, and as governments and the private sector get better at working together.

Under these indicative assumptions, private sector funds required could range from 10 per cent of \$300bn, to perhaps 15 per cent of \$400bn, i.e. between \$30–60bn over the next 10 years; with a sensitivity to the upside depending on whether private participation does indeed rise beyond the 15 per cent level. This compares with a reported \$25bn of private infrastructure investment over the last ten years.

Such funds are typically geared at around 70 per cent; implying an equity range of \$9–18bn, with upside potential. By way of comparison, the listed infrastructure sector is currently capitalised at around \$46bn.

## Chapter Two

### What attracts the private sector to infrastructure?

#### Summary

Around the world there are large amounts of capital looking for acceptable investment opportunities. Global demographics, including an ageing population saving for retirement, are driving this. Australia, with its rapidly growing superannuation funds, is no exception.

The scale of the demand for new infrastructure investment in Queensland, Australia and globally has created an opportunity for private sector investment, and infrastructure is fast becoming an asset class in its own right.

There are several major means whereby investors can make equity investments in infrastructure assets, including:

- listed securities;
- securities in unlisted investment vehicles; and
- direct ownership of a portion of the infrastructure assets.

Both individual and institutional investors are increasingly seeking to place large amounts into investments in infrastructure. Institutional investors, including institutional funds managers and large superannuation funds, are generating billions of dollars for investment in infrastructure.

Whilst there are some differences between the needs and motivations of the different types of investors, the fundamental attractive characteristics of infrastructure underlie its attractiveness to investors generally as a special investment asset class.

These include:

- low volatility of returns;
- returns exhibit low correlations with those of other sectors and other asset classes, and so infrastructure investments provide substantial diversification benefits in portfolios;
- inflation indexed cash flows;
- long dated assets to match their portfolio of long dated liabilities (especially superannuation funds); and
- attractive investment returns to date, especially in certain macro-economic circumstances (falling interest rates) where dividend yield is favoured; and as the virtues of the asset class have been discovered by growing numbers of investors bidding up the prices of limited existing infrastructure investment opportunities (investment demand has exceeded the supply of infrastructure securities available for investment).

However, going forward, we believe the competitive context may change, so that the above-average returns earned by early pioneers are competed away. This should occur

- as the supply of infrastructure assets increases;
- as structuring skills circulate around the market and availability increases;
- as governments become more adept at creating a conducive enabling environment and running efficient competitive bidding processes;
- as both the government and the private sector (including institutional investors) become more experienced at working together in PPP projects and in understanding each others' needs.

Alternatively, we may see the development of various means of sharing returns between the public and private sectors. This is being achieved through a variety of approaches overseas. Some examples of this are described in Chapter Six and include the public sector taking a portion of windfall gains upon refinancing, and tenders calling for option values to cap the excess value capture by the private sector over the base value/return.

It may be that Queensland, which has undertaken fewer PPP projects to date than some other Australian states and overseas governments, will prove to have been advantaged in having avoided

'full-on' commitment to private sector participation during the 'pioneering' stage of the PPP phenomenon.

Queensland, having been in a relatively strong fiscal and economic position throughout the past decade, has been under no fiscal 'pressure' to undertake PPPs. However, now that private sector investment funding is becoming much more extensive and thus competitive, the timing may well be right to increase the PPP activity in Queensland.

Queensland has the opportunity to learn from the experiences of the other states and overseas, to hone its skills and structures in creating a facilitative environment, and undertake PPPs under optimal ('win-win') conditions.

## Who are the private sector investors?

Both individual and institutional investors are increasingly seeking to place large amounts for investment in infrastructure, through a variety of avenues. Infrastructure is becoming a desirable investment asset class.

There are several major means whereby investors can make equity investments in infrastructure assets, including:

- securities (such as shares in companies or units in unit trusts which own and/or operate infrastructure assets) listed on a stock exchange (either Australian or overseas exchange); e.g. in Australia Transurban, AGL Energy, APA Group, Babcock and Brown Infrastructure;
- securities in unlisted vehicles which own and/or operate infrastructure assets managed by a fund manager which has established the vehicle to facilitate such investments; we have seen a rapid expansion in this class with Macquarie, Challenger, Colonial First State, Perpetual and others; and
- direct ownership of a portion of the infrastructure assets by way of a consortium, typically a small number of investors which each has a large and valuable holding, for example AMP and Queensland Investment Corporation in Thames Water.

The types of investors in infrastructure range from individuals (who may each have modest investments but who are numbered in hundreds of thousands, so the combined invested amounts may be very large), high net worth individuals, do-it-yourself superannuation funds, and institutional superannuation funds of various sizes, including many large funds with investment assets in the billions of dollars. Institutional fund managers also

invest in infrastructure assets and, through managed funds of various kinds (on behalf of both individual investors and superannuation funds), in infrastructure securities. Individuals are able to either invest directly in listed securities or in managed funds which then invest in infrastructure assets, or listed or unlisted infrastructure securities.

The listed sector is attracting large cash inflows from pension and superannuation funds looking for inflation indexed, low volatility long dated assets to match their portfolio of long dated liabilities, and to provide additional diversification benefits vis-à-vis other sectors. Infrastructure stocks have to date demonstrated a capability to deliver out-performance against broad market benchmarks, even though they are typically characterised by low volatility, stable cash flows and relatively low growth (at least, at the asset level). This in part reflects the fact that the prices of listed infrastructure securities have been bid up as the sector has been ‘discovered’ by investors attracted to the sector’s stable yields and diversification benefits – demand has increased before the supply of such securities could be increased sufficiently.

### Listed equities: risk-return characteristics

Listed infrastructure securities display attractive potential returns but also carry significant investment risk and diversification benefits.

### Listed equities: attractive asset class returns

The total return performance of the Global Infrastructure and Utilities sector has been strong. Globally, these stocks have out-performed over each of the last 1, 5 and 10 year time horizons.

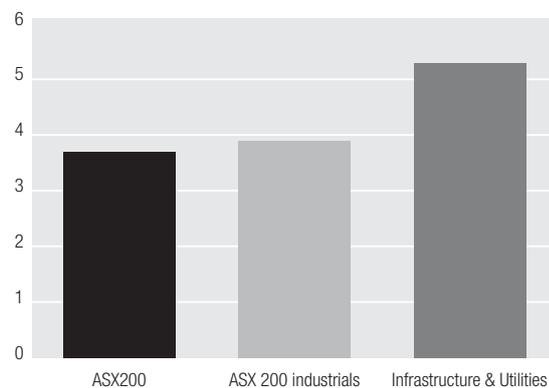
Performance such as this is unlikely to be the result of one single factor. Rather, a number of the following significant factors have coincided over time to produce this outcome. The most significant are:

- growth inherent in the infrastructure space. This is being driven by population growth, greater longevity, and economic growth – and thus the requirement for more infrastructure be built and renewed. Beyond these broad favourable factors, though, it is being driven by an expectation of greater utilisation and so toll type revenues. These factors drive revenue growth which, because of the nature of the assets, tends to be more readily predictable than is typically the case in other industries. Some studies have suggested that

revenue growth is the most important factor driving share price out-performance;

- demand from superannuation/ pension funds for investments capable of producing index-linked, reliable cash flows with a duration to map against the liabilities of these funds and so reduce their risk;
- changes in interest rate environments, with falling interest rates are particularly positive for these stocks (infrastructure stocks generally out-perform during falling rate environments and under-perform when rates rise);
- changes in the structure of infrastructure ownership, related to the asset packaging type structures employed to favourable effect during this relatively early stage of development; and
- increasing recognition and re-rating of the investment characteristics of infrastructure stocks. The most obvious is yield, with infrastructure stocks being typically higher yielding than other sectors. (Refer Chart 1.)

CHART 1: AUSTRALIAN DIVIDEND YIELDS 2007F

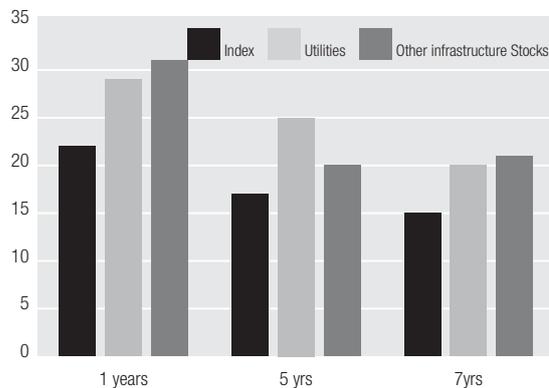


Source: Deutsche Bank

The ability of the sector to provide out-performing investment opportunities, driven by the factors listed above, is highlighted by Chart 2.

The chart shows the total returns generated by the index, the Utilities sector, and, separately, Other Infrastructure Stocks which are not included in the Utilities index (these are primarily the “transport” related assets, for example Macquarie Airports Group, Transurban, ConnectEast). Over the course of each of the periods analysed, infrastructure stocks have out-performed the local index, i.e. these returns on listed infrastructure stocks have been higher than the average for the broad market.

**CHART 2: AUSTRALIAN INFRASTRUCTURE VS INDEX: TOTAL RETURNS OVER TIME**



Source: Wilson HTM Analysis

In addition to the factors listed opposite, in part this reflects the ‘discovery’ of the sector by investors hungry for stable yields and diversification from the other asset classes, and the consequent ‘bidding up’ of the prices of the relatively limited supply of listed infrastructure securities.

It can be expected that returns will reduce to more ‘normal’ levels over time, under conditions of increased competition, as the private infrastructure sector grows and matures, and investment demand for infrastructure increases. A proviso is that governments become more adept at creating a conducive enabling environment and running efficient competitive bidding processes, and both the government and the private sector (including institutional investors) become more experienced at working together in PPP projects and in understanding each other’s needs.

## Listed equities: investment risk and diversification benefits

The infrastructure sector is an attractive investment asset class for important reasons other than solely realised returns.

One of the most significant reasons relates to investment risk characteristics.

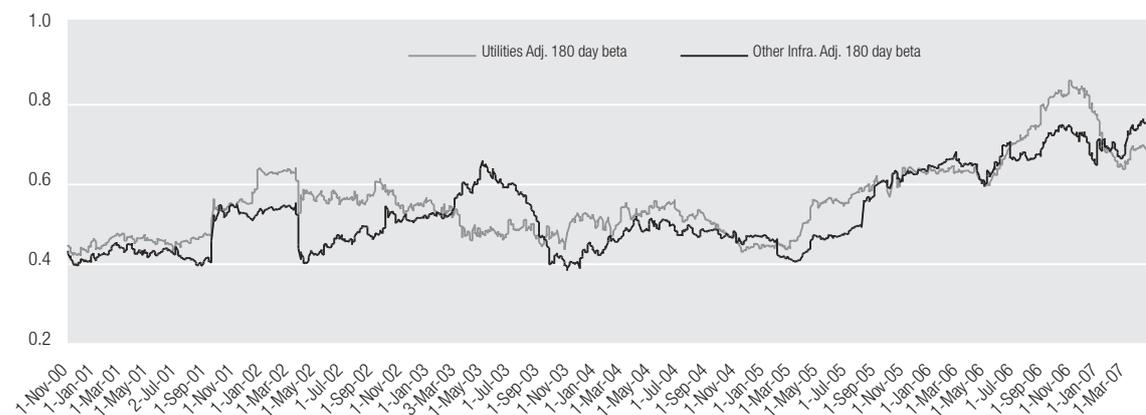
Principally these are:

- lower volatility of returns than for other equities market sectors. Global studies have indicated that the standard deviation of returns from the sector are lower even than for other sectors with similar risk/ return and cash-flow profiles (e.g. real estate);
- lower ‘tracking error’ – or variation in returns for the sector relative to the returns for the benchmark return, which is a critical factor for fund managers seeking to control performance and optimise returns over time; and
- high ‘information ratio’ (ratio of the sector’s return divided by the tracking error (a measure of reward per unit of risk)).

Risk can also be measured through stock betas. Chart 3 shows the 180-day betas for Australian Infrastructure sectors, as defined above. A measurement below one indicates the sector imparts a lower level of volatility to the market portfolio than average. Similar results are found for infrastructure investments in other markets (i.e. betas significantly less than one).

Infrastructure is a unique asset because of its low correlation with other asset classes. It has a positive correlation with sector indexes for listed property

**CHART 3: AUSTRALIAN INFRASTRUCTURE SECTORS: BETAS**



trusts, and builders & contractors, and a negative correlation with the ASX as a whole, as well as with direct property, utilities, energy & telecommunications sector indexes. These qualities suggest that infrastructure as an investment class is an excellent diversification tool for mixed-asset portfolios.

### **Structured products: private sector financial innovation in listed markets**

One of the factors behind the performance of the sector globally has been the significant activity by the private sector in establishing infrastructure funds and vehicles to facilitate the construction, delivery and operation of infrastructure assets. Investment has been directed either into new projects or into acquisition/enhancements of existing assets.

Companies with financial structuring skills, such as Macquarie Infrastructure Group (MIG) and Babcock and Brown, are generally regarded as having been the innovators of the infrastructure investment template in Australia. In the early stages of development of this market, competition has been limited, and skills scarce due to a limited number of participants. These early life-cycle stage characteristics may have contributed to these few private sector participants being able to obtain higher than average returns.

This above normal value to private sector innovators may erode quickly as competition increases and other participants develop or acquire the requisite skills (or seek to replicate the template); and as the public sector becomes more sophisticated in its ability to work with a broader range of private sector groups to encourage and facilitate maximum private sector interest.

This is entirely typical of industry evolution and will be good for governments, the public and some investors.

Competition, achieved through well structured / efficiently well-run tendering processes, will then ensure fair and attractive pricing, given that private sector enthusiasm is strong.

It may be that Queensland, which has undertaken fewer PPP projects to date than some other Australian states and overseas governments, will prove to have been advantaged in having avoided 'full-on' commitment to private sector participation during the 'pioneering' stage of the PPP phenomenon.

Queensland, having been in a relatively strong fiscal and economic position throughout the past decade,

has been under no fiscal 'pressure' to undertake PPPs. However, now that private sector investment funding is becoming much more extensive and thus competitive, the timing may well be right to increase the PPP activity in Queensland.

Queensland has the opportunity to learn from the experiences of the other states and overseas, to hone its skills and structures in creating a facilitative environment, and undertake PPPs under optimal ('win-win') conditions.

If the Queensland government can learn to work well with large institutional investors, particularly superannuation funds, for example, it may achieve a situation where those institutions may directly own a portion of tendered infrastructure assets as a participant in a consortium of equity investors. This can have the advantage of avoiding the costs associated with establishing and operating the unlisted investment vehicles, including the cost of passing benefits to pioneering innovators, enabling the sharing of those savings – a 'win-win' outcome for both the Queensland public and the superannuation fund investors.

### **Unlisted structures – unlisted trusts and direct investment via a consortium of large investors**

High net worth individuals and institutional investors, including superannuation funds of varying sizes, are able to invest in unlisted vehicles such as unit trusts. These are less liquid investments but may produce more consistent, reliable returns as the unit prices are based on asset valuations rather than listed market prices. Such vehicles also have the advantage of saving the costs associated with listing and meeting the requirements of being listed entities.

Large institutional investors, particularly superannuation funds, are able to invest either in listed securities (often via specialist funds managers), or more directly in infrastructure assets either by way of investing in unlisted securities or by directly owning a portion of such assets as a participant in a consortium of equity investors. This can have the advantage of the institution having a greater say in the management of the infrastructure asset, in addition to the cost advantages outlined above. The long duration nature of the investment, matching superannuation funding liability profiles, is also more evident.

Nevertheless, irrespective of the type of investment vehicle involved, the fundamental characteristics of infrastructure underlie its attractiveness to investors generally as a special investment asset class.

The particular characteristics of infrastructure which make it attractive to investors include:

- low volatility of returns;
- returns exhibit low correlations with those of other sectors and other asset classes, and so infrastructure investments provide substantial diversification benefits in portfolios;
- inflation indexed cash flows;
- long dated assets to match their portfolio of long dated liabilities (especially superannuation funds); and
- attractive investment returns to date, especially in certain macro-economic circumstances (falling interest rates) where dividend yield is favoured and as the virtues of the asset class have been discovered by growing numbers of investors bidding up the prices of limited existing infrastructure investment opportunities (investment demand has exceeded the supply of infrastructure securities available for investment).

## Chapter Three

### Private sector funding sources

#### Summary

A great deal of private sector capital is becoming available for investment specifically in infrastructure assets around the world. (Different capital providers often get involved in infrastructure projects at different stages of the project's maturity, depending on their own particular competence and requirements.)

At the same time there is clearly a major, and rapidly growing, demand for such capital by governments throughout the world, with enormous infrastructure construction tasks ahead. Infrastructure has become a global industry.

Australia fits into this picture as both a supplier of capital, through our substantial superannuation and managed funds industry (the fourth largest in the world) and as a user of such capital, given the major infrastructure construction tasks ahead for the various Australian governments, including Queensland. Stating the obvious, there seems a major potential opportunity for the two groups – Australian governments and Australian superannuation and other institutional investors – to work together to achieve their mutually compatible goals. Each will need to understand the other's needs and be competitive relative to the other's alternative partners.

Queensland needs to have the ability to compete for the capital and other resources it needs in order to build its required infrastructure on favourable terms. A globalising supply and demand backdrop means the Queensland agencies will need to understand this complex scene and the participants it wants to work with (e.g. Australian super funds) and have as attractive an enabling environment for them as they will be offered in other states, or overseas, to mutual benefit – or the investors will deploy their money elsewhere.

Equally, Australian institutional investors must compete for the right to invest, and give government value for money.

#### Overview

In the 10 years to 2006, there was approximately A\$25bn of privately financed infrastructure projects completed in Australia, with funding coming from public equity markets, institutional investors, the managed funds sector, and private equity markets<sup>11</sup>. But private sector interest in infrastructure has been accelerating in the last few years, and this is an ongoing and very favourable development.

Superannuation funds, with their long time horizons, extremely strong ongoing cash inflows and ability to make long term, illiquid investments, are potentially ideal major investors in this sector. A side-benefit is the fact that the ultimate beneficiaries of these funds, given the very widespread participation in superannuation in Australia, are millions of ordinary Australians – the citizens who are also, by and large, the ultimate users or consumers of Australia's infrastructure networks and services.

We believe there is the potential for superannuation funds to be a very major source of investment capital for infrastructure in Australia over the coming decade and beyond, particularly if governments can find ways to get closer to these funds and understand their unique situation and needs. For example, being trustee organisations, superannuation funds have special governance requirements and tend to make extensive use of specialist advisers. In addition to superannuation funds' unique needs, they have the same needs as other investors (i.e. for an efficient, transparent facilitation environment etc). These funds may need to work with specialist organisations which can help them locate desirable infrastructure assets and participate in the government PPP processes e.g. bidding as part of a consortium.

If governments can work more closely with these funds and their advisers, a major 'win-win' position is possible by matching the needs of government with the needs of these superannuation fund institutions. Governments will benefit from more attractive pricing and other terms in an environment of strong (and growing) supply of private sector infrastructure capital. To achieve this, the Government will need to encourage and facilitate maximum private sector interest, with a genuine understanding of the sector's needs, and close co-operation.

Competition, achieved through well structured / efficient tendering processes, will then ensure fair and attractive pricing, given that private sector enthusiasm is so strong.

Australian superannuation and other managed funds will also have the ability to invest in infrastructure overseas, where demand for infrastructure capital is also expected to be significant. At the same time, overseas domiciled pension funds are likely to have an appetite for investment in Australian infrastructure if the environment is conducive. Australian governments will need to work to 'compete' for the interest of superannuation/pension and other managed funds in this context.

A related issue is the scarcity to date of the structuring, risk management and pricing, and transaction origination and execution skills mentioned. If superannuation funds can gain increased access to such skills this will facilitate increased infrastructure investment by them. Increased availability of those skills will also be of benefit to governments as this will reduce the ability of the early innovators in the sector to extract above normal returns. This is likely to occur as the industry develops and matures, and the required specialist skills become more widespread.

## Sources of funds – Australia

The various major sources of funds for financing infrastructure are set out below.

### AUSTRALIAN SUPERANNUATION (PENSION) FUNDS<sup>12</sup>

The infrastructure sector has increasingly been attracting a larger percentage of funds under management as fund managers and superannuation funds are attracted by the stable and relatively strong yields of the sector, and for the other reasons indicated in Chapter 2.

Managed funds and superannuation funds in Australia are very large and are growing rapidly, and

are ideal sources of funding for private sector investment in infrastructure.

The Australian Prudential Regulation Authority (APRA) reported that superannuation funds under management totalled \$1095.9bn as at the end of December 2006 which is equivalent to the nation's GDP<sup>13</sup>

Co-incidentally, managed funds in Australia have also reached \$1 trillion, standing at \$ 1.1trillion at 31 December, 2006<sup>14</sup>

### *Growth of the Australian Superannuation Market*

Financial deregulation and the superannuation policies of the 1980s and the 1990s, and continuing now, have created an abundance of available capital in the private sector, particularly in superannuation and other managed funds.

The rate of growth in superannuation balances has been accelerating through the current decade and in the latter half of 2006 were growing at close to 20 per cent per annum.

The expected strong growth in Australian superannuation assets has been well-documented. There are many different forecasts available, and these differ according to the underlying assumptions made with respect to inflow growth, and especially annualised returns on assets. However, all of the forecasts expect substantial growth.

Trowbridge Deloitte have forecasted total super assets to reach \$2.4trn by 2015 and \$3.6trn by 2020:

- Buttler Walker estimates the total could reach \$2trn by 2012 and \$3trn by 2016;
- Macquarie estimate superannuation assets will reach A\$1.8trn by 2011 and then rise to A\$3.3trn by 2017; and
- By way of sensitivity, our calculations suggest that if the Australian Superannuation market grows at 10 per cent per annum, which is substantially less than current year on year growth rates, assets under management could reach A\$2.15trn by the beginning of 2015.

### *Super funds available for infrastructure investment*

Assuming a 2 per cent allocation to the infrastructure sector, and using the low end of the spectrum of the potential forecasts above (i.e. \$2.15trn by 2015), this could equate to A\$43bn of superannuation assets available for investment in infrastructure by 2015. Using a more aggressive but

still reasonable assumption of \$3trn by 2016 would produce \$60bn of superannuation assets for the infrastructure sector.

These funds would then be geared up. Applying gearing levels of 75 per cent (standard gearing is 70 per cent for a fund; 80 per cent would be aggressive) would produce A\$172bn of total funds under the former scenario and \$240bn under the latter, by way of total funds for investment in Australia's future infrastructure. These figures compare with an estimated total demand of \$300–400bn in the next decade – which will be partly funded from public funds.

A further sensitivity to these numbers is possible. In Europe, fund allocation to infrastructure is estimated at less than 2 per cent on average with portfolios ranging from 1–5 per cent asset allocation. Some market commentators are estimating that asset allocation could increase to 6–10 per cent in five years if European pension funds continue to invest heavily in the infrastructure sector<sup>15</sup>.

Of course, not all of the allocations of Australian superannuation funds to infrastructure will be invested in Australia. Australian infrastructure projects must compete in the global marketplace for infrastructure investment, and Australian superannuation funds will invest in overseas infrastructure if returns and the infrastructure investment environment created by overseas governments are more attractive. We return to these points, which we consider critical, later in the current section.

#### AUSTRALIAN INSTITUTIONAL INVESTORS / MANAGED FUNDS

These investors can invest in infrastructure projects through equity capital markets when an infrastructure fund vehicle is listed, or as a private placement or direct investment in an unlisted fund

vehicle. Institutional investors are attracted to infrastructure for all of the reasons already listed. The degree to which each factor weighs on any specific investment decision is dictated by the investment philosophy of the fund (i.e. growth vs. income, risk profile, long term vs. short term, index vs. absolute return, etc.)

Institutional investors include both wholesale and retail funds managers (including master funds and wrap accounts), index funds and specialist funds, insurance companies, bank owned fund managers, foreign fund managers and superannuation funds.

#### PROJECT SPONSORS

These include constructors who commit to invest in a percentage of the upfront equity of the project (typically 10 – 15 per cent). Sponsors look to recycle their capital upon construction completion or asset refinancing, freeing up funds for new projects by selling their share either to existing equity holders of the project or into the secondary PPP market. MIG M6 type structures are favoured as the sponsor is able to exit at the first refinancing point when dividends are usually paid. Examples include Bilfinger BOT (NSBT), Transurban (Citylink, M7), etc.

#### AUSTRALIAN SPECIALIST INFRASTRUCTURE FUNDS

These are specialist investment vehicles dedicated to investing in, and/or managing, infrastructure assets. Each of Macquarie Bank, Babcock and Brown, Transurban, Connect East, and Hastings Funds Management have raised funds through capital raisings. These can vary substantially in their scope and nature. Some are direct owners and managers of infrastructure assets, others are more in the nature of 'fund of funds', etc.

Table 4 shows the market capitalisation of infrastructure funds raised on the ASX for the period 2005 to March 2007.

TABLE 4: INFRASTRUCTURE FUNDS

				LAST 12 MONTHS	
	MARCH 05	MAR 06	% CHANGE	MAR 07	% CHANGE
Market cap (\$bn)	27	37	40.0%	46	23.1%
Number listed (actual)	13	19	46.2%	22	15.8%
12 month avg trades	45,258	80,649	78.2%	117,499	45.7%
12 month avg value (\$b)	1.43	2.57	79.5%	2.95	14.9%

Source: ASX Listed Management Investment (LMI), March 2007

Infrastructure funds in Australia are managed vehicles with exposure to the underlying characteristics of a portfolio of infrastructure assets. Australia and Canada pioneered the global trend of investing in these assets with dedicated funds being launched in the sector by Macquarie Infrastructure Group, Babcock and Brown, and large pension funds including the Canadian Pension Plan Investment Board and the Ontario Municipal Employees Retirement system.

Some of the infrastructure funds classified as such and listed on the Australian Stock Exchange are shown in Table 5.

**TABLE 5: AUSTRALIAN INFRASTRUCTURE FUNDS**

ASX CODE	NAME	TYPE
AIHCA	Alinta Infrastructure Holdings	Stapled
APR	Api Fund	Units
AIX	Australian Infrastructure Fund	Units
APA	Australian Pipeline Trust	Stapled
BBI	Babcock & Brown Infrastructure Group	Stapled
BBP	Babcock & Brown Power	Stapled
BBW	Babcock & Brown Wind Partners	Stapled
CIF	Challenger Infrastructure Group	Stapled
CEU	ConnectEast Group	Stapled
DUE	Diversified Energy & Utility Trust (DUET)	Stapled
ENV	Envestra Limited	Stapled
HDF	Hastings Diversified Utilities Fund	Stapled
MAP	Macquarie Airports	Stapled
MCG	Macquarie Communications Infrastructure Group	Stapled
MIG	Macquarie Infrastructure Group	Stapled
MIT	Mariner Pipeline Income Trust	Stapled
SPN	SP AusNet	Stapled
SKI	Spark Infrastructure Group	Stapled
SRG	Sydney Roads Group	Stapled
TCL	Transurban Group	Stapled
VIR	Viridis Clean Energy Group	Stapled

Source: ASX Listed Management Investments, 31 March 2007

## Sources of funds – international

In recent years, the global emergence of infrastructure as an asset class has been one of the key features of global markets. This section provides some background to this phenomenon.

### THE GLOBAL EMERGENCE OF INFRASTRUCTURE FUNDS

The supply of funds, looking for a home, around the world is very large and growing very strongly.

Thomson Financial<sup>16</sup> has estimated the total funds raised for investment specifically in the sector is around US\$300 billion. These funds can then be geared up to produce a pool of funds between \$1 – 1.5 trillion.

Both the rate of growth in the number of new global infrastructure funds established each year; and the size of those funds have accelerated substantially over the last few years.

- 7 funds were established in 2004.
- 9 funds started trading in 2005 at an average size of US\$300m
- As at September 2006, 9 infrastructure funds were established at an average size of \$700m. A further 17 were in start-up at that time<sup>17</sup>.
- Further activity is expected in 2007.

Table 6 analyses the potential new money flows resulting from these new funds alone. Note the numbers are calculated only off the value of the equity raised at the time of raising (i.e. before any capital appreciation derived from stock market performance). The numbers are also likely to be under-stated; and are certainly under-stated for 2006–7 in respect of the 17 funds which were in start up during 4Q06. Our calculations assume that none of these were active in 2006; and that ONLY those 17 will be established in 2007. This is clearly conservative.

Nevertheless, even based on such a crude and conservative approximation, the available pool of funds is likely to have grown very substantially since 2005.

Another indication of the growth rate comes from Macquarie's Global Infrastructure index. In 2005, it registered a total market capitalisation of US\$1.2trn. This compared with US\$465bn in 2000, a CAGR of 21 per cent. Again, we note that market capitalisation does not include the value of debt.

## GENERAL INFRASTRUCTURE AND BANK MANAGED FUNDS

It is not hard to identify infrastructure funds popping up all around the world. General infrastructure and bank managed funds include:

- In France, The Fonds de Reserve pur les Retraites, €29bn state fund is moving into the infrastructure sector as part of its review of its strategic asset allocation levels.
- The UK Universities Superannuation scheme announced in June 2006 that it intends to invest up to 25 per cent of its £21.7bn in assets in alternatives including infrastructure.
- CIMB and Standard Bank have launched the US\$250m South East Asian Strategic Assets Fund in March 2006, a private equity fund investing in infrastructure, energy and natural resources deals in South East Asia. The fund's co-sponsor is the Employees Provident Fund of Malaysia.
- Temasek Holdings, Singapore's state-owned investment company, has announced plans to start an infrastructure fund backed by S\$800 million (\$513 million) of water and gas assets. Temasek has hired Morgan Stanley to sell as much as \$150 million in equity as part of the fund's IPO, planned for the first quarter 2007.
- Morgan Stanley, Merrill Lynch and JP Morgan are also moving into infrastructure as are Kohlberg Kravis Roberts and Blackstone.

- In May 2006, Credit Suisse and GE announced that they intended to form a US\$1bn joint venture to invest in global infrastructure assets.

## Dynamics – Global review

These funds have been raised because the need for new infrastructure is a vast and global phenomenon.

In their press release announcing their intention to form a US\$1bn joint venture to invest in global infrastructure assets, Credit Suisse and GE Infrastructure stated that.

*Each party plans to commit US\$500 million to the joint venture. Targets will include power generation and transmission, gas storage and pipelines, water assets, airports, air traffic control, ports, railroads and toll roads. The infrastructure joint venture estimates the market opportunity at US\$500bn in developed markets and US\$1trn in emerging markets over the next five years. (Credit Suisse/GE Joint Press Release, May 31st 2006)*

In line with that market appetite, the regulatory environment for public infrastructure procurement is changing on a global scale in order to facilitate private procurement.

In this section we provide a brief overview of regulatory and current/ expected investment trends across the world. The review highlights;

TABLE 6: INFRASTRUCTURE FUNDS – MONEY FLOWS PA

	2004	2005	2006	2007
Funds established and active during the year	7	9	9	17
Average size of fund US\$m	n/a	300	700	700
Total new equity available during the year US\$m	n/a	2,700	6,300	11,900
<b>Gearing at 70%</b>				
Scenario gearing level		70%	70%	70%
Implied debt		6,300	14,700	27,767
Scenario total available new fund pool pa		9,000	21,000	39,667
Cumulative new money available \$m, 2005-07				<b>69,667</b>
<b>Gearing at 80%</b>				
Scenario gearing level		80%	80%	80%
Implied debt		10,800	25,200	47,600
Scenario total available new fund pool pa		13,500	31,500	59,500
Cumulative new money available \$m, 2005-07				<b>104,500</b>

Source: Private Equity Investor; WHTM Analysis

- burgeoning interest in securing private funding for infrastructure requirements round the world; and
- differing levels of maturity within each of the various local markets – implying differences in available projects, pricing, risk, and liquidity of PPP investments.

### *Europe*

Europe is rolling out its own PPP framework under the EU umbrella, with an EU Green Paper on PPPs indicating that interest in the procurement approach is increasing on a supranational level.

We estimate the total value of signed private finance initiative (PFI)/PPP projects to exceed €130bn currently with a similar amount in the pipeline.

- The majority of EU members voted in favour of a European PPP agency as a centre of excellence and focal point for resources and documentation.
- PPP activity is also expected to pick up under the EU-wide approach to guarantee part of the debt related to the priority cross-border transport infrastructure project debt and stimulate private investment in Trans-European Network projects<sup>18</sup>.
- The **United Kingdom** is the most advanced PPP practitioner in Europe, and arguably globally. Much of the discussion in this paper derives from UK experience. The market's sophistication reflects in its size – an estimated £50bn of projects, and an additional £20–30bn in the pipe.
- **Spain** introduced its PPP framework in 2003 with the intent of attracting private investment in public assets. The market has grown rapidly, particularly after the Spanish Public Works Ministry announced the draft transport plan for 2005–2020 – the plan envisages €249bn in road and rail infrastructure over 15 years, including €90bn in ports, rail, roads and airports. Expectations are for as much as 40 per cent of the total to be financed by the private sector.
- **France** has a long history of private sector participation, especially in toll roads, and has recently enacted new legislation. In June 2004, The Partnership Ordinance was enacted, allowing for a new form of contractual relationship, the Contract de Partenariat. This permits the DBFO model where the concession winner will be responsible for construction and maintenance of the project, while the performance related payments can be spread out over the term of the contract. In May 2005, the government established a Ministry of Finance PPP unit raising expectations of increased use of PPPs.

- In **Germany**, PPPs are gathering momentum. The development of the PPP framework has generally been used by local authorities who have adopted the model for the procurement of schools and offices. The complexity of the various interfaces between federal, state, and municipal levels presents barriers to creating standardised models. However, the model is advancing slowly, with the finance minister announcing in early 2006 that the government wants to increase private sector investment in public infrastructure and see the level of PPPs rise to 15 per cent of overall investment from 4 per cent, which is on par with other industrial countries. Very strong growth is expected in this market, with some suggesting Germany could become as big as the UK over time.

- In **Italy**, already a big market, tight budgetary conditions are expected to sustain PPP growth, however delays in tendering, and between the award of the concession and financial close, have resulted in lower growth than expected

### *United States*

The US has significant requirements. Roads investment will be substantial – c.US\$600bn by 2006, US\$770bn in 2015, and US\$1,030bn by 2030 to maintain and improve the nation's road transportation networks<sup>19</sup>. The U.S. Private Toll market represents c.US\$10bn in announced transactions with a market potential size of c.US\$300bn over the next ten years.<sup>20</sup> Water infrastructure investment will also be substantial.

The impetus behind PPP projects is building.

- As at April 2006, 14 states had enacted legislation and another 5 have introduced legislation to enable the equity financing and privatisation of infrastructure assets.
- States like Texas and Florida have large PPPs in train.
- New York is considering PPP legislation for the privatization of a number of its roads. The state has appointed an investment banking adviser to scope out the potential of the toll road landscape.
- California has amended its transportation legislation (1989 Transportation Facilities Bill amended in 2006) to facilitate PPPs.

### *Canada*

Like Australia, Canada has developed a local framework through drawing on the UK PFI-like framework and relevant PPP legislation has been enacted. Canada is an advanced market.

### *South-East Asia.*

- In **India**, the infrastructure investment requirement is significant with a reported US\$700bn needed in the next five years, thus making it potentially an extremely attractive market for the future private equity investment.
- In **Japan** over 450 PPPs have commenced or are in train. Enabling legal and regulatory changes were enacted in 2003.
- **Indonesia and Malaysia** have passed legislation. Indonesia has a history of utilising private capital for infrastructure needs.

### **Specialization and liquidity in developed secondary markets**

In the UK, the development and increasing use of the PPP procurement model by contractors, lenders and primary investors globally has produced a deep and sophisticated secondary market capable of providing liquidity to operators and constructors so they are able to recycle their equity and bid for new projects. A sufficiently deep secondary market also provides an exit strategy for seed capital investors and an investment opportunity for investors with a lesser risk appetite than those initial investors.

In the UK, the structure of the PPP market has evolved to display elements of specialisation within the various stages of project development, so that the cast of players “segment” as follows:

- the primary funds whose businesses revolve around construction and the need to recycle equity in completed projects so they can move on to bid for the next project;
- the secondary funds, i.e. traditional, long-term holders of PPP and PFI projects which have typically reached operating stage – with more stable cash flows providing reasonably predictable investor returns; and
- those that operate in both the primary and secondary fields.

Accompanying this sophistication is a greater understanding and acceptance of PFI/PPP assets as an asset class within the investment community. Secondary funds represented approximately 10 per cent of the total PPP market in November 2005 and are now among the largest investors in the UK PPP sector. There is an expectation of greater participation from pension funds either directly or through asset managers<sup>21</sup>.

There is a wide awareness of the potentially positive implications of these various factors in the UK. UK authorities consult with key secondary market players to ensure that a liquid secondary market will exist for their largest PPP initiatives.

A number of UK secondary market PPP examples are referenced below.

The development of these secondary markets has important implications. It suggests that as infrastructure markets develop and deepen, additional investors become attracted to the sector. This will produce greater value for money outcomes.

## **CASE STUDY**

### **RECENT INNOVATIONS – SECONDARY MARKET INFRASTRUCTURE FUND (SMIF)**

Of the three largest secondary equity investors in the UK, Secondary Market Infrastructure Fund (SMIF) was probably the most innovative in 2005.... It raised £250m in funding by leveraging against its portfolio of UK PPP/PFI Equity. The debt was structured as a six year bullet with the margin paying 150bp (basis points) over LIBOR to year five and 200bp to year six with banks offered £27.5m tickets. The pricing was higher than an ordinary vanilla PFI deal because banks were lending against equity, but lender risk was mitigated by the cross collateralisation effect of a portfolio. Detailed lending studies were undertaken which showed that a significant number of projects would have to fail to threaten debt service. The lead arrangers also took comfort from a set of covenants that limited SMIF's equity exposure to any one project, operator or sector.

SMIF has a large asset management team, both to oversee defensive strategy on asset value and to create new profit opportunities. SMIF was established in 2001 by Babcock and Brown and Abbey National and was acquired by Star Capital, Halifax Bank of Scotland (HBoS) and AMP in a buy-out in December 2003. In 2005 the fund attracted new equity backers, Bank of Scotland and AMP Capital. The fund represents the largest secondary project finance initiative investor in Europe and was recently sold to Land Securities Group PLC in February 2007 for £527m in equity with the acquirer assuming c.£400m of SMIF's net debt.

Source: EMEA PFI Leveraged Finance Deal of the Year 2005, Project Finance Magazine, March 2006, WHTM

## CASE STUDY

### SELECTED PRIMARY AND SECONDARY PPP FUND RAISINGS

Henderson's PFI secondary fund closed oversubscribed, initially targeting £250m, but finally closing at £330m in October 2005. The Henderson fund highlights the increasingly broad appeal of PPP assets to global institutional investors – fund investors include pension funds, insurance companies and family offices from the US, UK and mainland Europe. Private equity house 3i invested GBP150m in Infrastructure Investments (I2) in June 2005 – making I2 the largest of the UK PPP secondary equity funds at £450m.

Italy has established its first PPP fund, Fondo PPP Italia, raising 120million. The fund received commitments from the EIB and a number of local and European banks. Although small compared to SMIF and I2, the fund could have a dramatic impact by kick-starting a secondary market in Italy, whose domestic constructors have struggled with weak balance sheets and thus limited in their ability to recycle equity for new projects. The fund will initially target home investments but may look to invest in international investments with home sponsors.

Source: Project Finance magazine, November 2006, 2005 and 2004

## CASE STUDY

### DEXIA INFRASTRUCTURE FUND INNOVATION

A recent innovation in the structuring of infrastructure funds was the securitisation of AAA-wrapped infrastructure bonds by Dexia. The securitised portfolio represented £1.47bn (US\$2.86bn) and allowed Dexia to free-up its balance sheet for further acquisitions / investments in the sector. The transaction was structured as a synthetic collateralised bond obligation (CBO), so the debt remains on Dexia's balance sheet. The securitised portfolio comprises seven bonds issued in relation with PFI projects, and 21 bonds issued by regulated utilities in the water, electricity or gas sectors. The bonds are wrapped by seven mono-line insurers.

Credit risk related to the wrapped infrastructure portfolio is transferred to external parties through two credit default swaps (CDS): a non-funded super-senior credit default

swap with an undisclosed counterparty and a junior credit default swap with WISE 2006-1 Plc, a special purpose company registered in Ireland. Wise 2006-1 has issued three tranches, ranging from AAA/Aaa to AA-/Aa3, pricing from 30bp to 39bps over Eurbor. (S&P and Moody's respectively): a £30m AAA-rated class A, a £22.5m AA-rated class B, and a £11.25m AA-rated class C. The notes have a scheduled maturity of October 2056 (50 year bonds) with the tranches placed with several banks and insurance companies.

The deal was done for capital adequacy reasons. Despite being AAA-rated, wrapped debt under Basel I is 100 per cent risk-weighted, which is onerous for large holders of wrapped PFI and utility paper. On securitisation, the debt's risk weighting on Dexia's book falls from 100 per cent to about 20 per cent, freeing up capital which will allow more of this type of lending, lowering the cost of capital and importantly boosting Dexia's Equity IRR.

The transfer of risk of a £1.5bn AAA paper portfolio, Dexia has effectively released some regulatory capital to reinvest. Due to an anomaly in the financial markets the cost of protection using the CDS market has been less than the interest yield on the bonds, resulting in an arbitrage situation – the negative basis trade. Given the unique nature of the underlying portfolio, a securitisation on a portfolio of wrapped bonds is particularly efficient due to the very low probability of a double default. For there to be a loss in the CLNs, and/or the super-senior CDS there needs to be a credit event on both underlying PFI or utility bonds and the monoline wrap.

The negative basis trades are also helped by the monolines appetite for wrapping infrastructure paper (particularly the US insurers; fondness for UK utility debt) and the current disparity between the pricing of uncovered project/utility debt and the pricing of wrapped debt. Institutions want new-issue BBB rated paper at around 100bp, but with monolines wraps falling from the 25–35bp range of two years ago to 15–20bp now, and AAA paper currently trading at 50–60bp, there is a 20–30bp arbitrage play on wrapping an underlying BBB.

Source: Project Finance Magazine, December 2006/January 2007.

## Further indications of offshore market sophistication

This section describes just one example of how private sector markets develop and create innovations which are beneficial in the dissemination of risk and accessing capital on terms which both increase the availability and reduce the cost of infrastructure.

### GROWTH OF THE CREDIT DERIVATIVES MARKET (CREDIT DEFAULT SWAPS)

Private sector innovation has resulted in the de-risking of a number of public infrastructure assets by the private sector through credit derivative products. They have been successfully used on many land transportation projects i.e. toll roads, bridges, tunnels, with the UK's M6 and the Lane Cove Tunnel in Sydney prime examples.

The application of credit derivatives, specifically credit default swaps, is extensive in, for example managing the risks of key elements of a road project – namely construction, traffic demand, and financing as well as the operational risk upon commissioning. Credit default swaps allow one party (for instance an infrastructure owner) to buy protection from another party (i.e. an insurer) for losses that might be incurred as a result of default by a specified reference credit e.g. a toll road.

The British Banker's Association Credit Derivatives Report 2006 shows that the size of the Credit Derivatives market is expected to reach US\$20.2trn by 2006 (the predicted market forecast in 2004 was US\$8.2trn by 2006) and US\$33trn by 2008. Single name credit default swaps are estimated to represent 32.9 per cent of total in 2006.

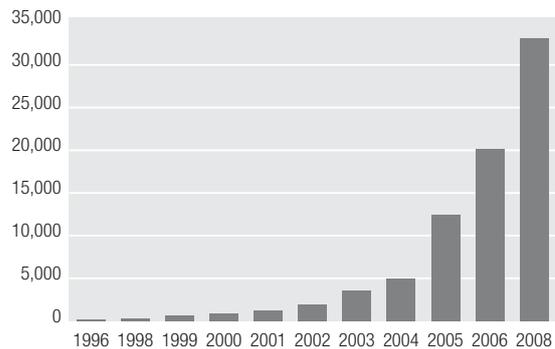
The growth in the market can be attributed to the diversity of products with an expansion in index trades, tranching index trades and equity-linked products. These have created an unprecedented variety of traded products in the credit derivatives market<sup>22</sup>.

The market is dominated by London which has an estimated market share of 40 per cent.

Two important implications of this growth in the credit derivatives market are:

- the very large scale on which the world is adopting private sector infrastructure provision, and the associated increase in sophistication and development of mechanisms to enhance the efficiency and cost-effectiveness of these markets. Private sector markets find ways to manage risks which are highly effective; and

CHART 4: GLOBAL CREDIT DERIVATIVES MARKET (2006)



Source: British Bankers Association 2006, International Swaps and Derivatives Association Inc. 2006

- an increase in the infrastructure project participation of private sector organisations which might otherwise find the risks too great, thus increasing competition, further improving the value for money of infrastructure projects.

## Implications of such growth in the global market place

We have identified three implications for Australia from this substantial current and expected growth.

### AUSTRALIAN INFRASTRUCTURE ASSETS WILL ATTRACT INVESTORS FROM OFF-SHORE

Some of those global funds identified above will seek to invest part of their funds in Australia.

### FOREIGN ASSETS COULD LIST IN AUSTRALIA?

It is possible that more foreign assets may seek listing on the Australian markets or raise capital from Australian sources in order to take advantage of the appetite for assets. At this stage there is little evidence of this occurring.

### AUSTRALIAN FUNDS WILL INVEST OFFSHORE

The biggest impact is likely to be that, in search of bigger and/or faster growing markets, and/or geographical diversification and so portfolio balance, funds managers and asset consultants will divert some of those Australian savings away from the domestic infrastructure scene. Moreover, a lack of suitable and attractively priced infrastructure assets in Australia (or an unwillingness of Australian state governments to provide sufficiently attractive investment environments and propositions) is likely to accelerate that shift.

Such off-shore funds flows are already happening and there has been some significant activity locally. Examples include:

- Lazard has launched a Global Listed Infrastructure Fund (GLIF) to invest in quoted infrastructure stock around the world. The fund was initially to be based in Australia and has recently listed on the Toronto Stock Exchange (February 2007) raising C\$135 million. The fund will invest in 25 – 50 preferred infrastructure companies globally.
- Macquarie has launched a similar fund, the Macquarie International Infrastructure Securities Fund – an unlisted vehicle investing in international infrastructure assets with a market capitalisation at January 2007 of c.A\$223 million with A\$123 million coming from retail investors and A\$100 million from institutional investors.

## CASE STUDY

### MACQUARIE BANK GLOBAL INFRASTRUCTURE FUNDS

With around 100 infrastructure and related assets across 25 countries, Macquarie's managed funds span a truly global footprint including everything from toll roads, airports and aged-care facilities, to ports, power stations and even commercial radio licences. One of Macquarie Bank's recent ventures was the establishment of a wholesale fund that focuses on investments in major pieces of infrastructure in European member countries of the OECD (Organisation for Economic Co-operation and Development).

The Macquarie European Infrastructure Fund (MEIF) (and its follow-on fund the Macquarie European Infrastructure Fund II, established in 2006), attracted some of the world's leading institutions, closing at €1.5bn (around A\$3 billion). This was a significant achievement for a fund that opened in April 2004, while MEIF II quickly built up committed funds of €1 billion.

Source: Infrastructure Partnerships Australia, 2007, "To Build a Nation"

- Macquarie has also dual-listed the Macquarie Korea Infrastructure Fund on the LSE and Korean stock exchanges raising KRW942bn (A\$1.27bn). The fund has 15 Korean infrastructure projects of which 6 are still under construction. An interesting point here is that the fund acquired/established the assets first before listing them as a fund on an exchange.

- UBS has also followed suit launching its own infrastructure fund from the Australian arm of the Global Investment Bank. See Case Study Box below.

## CASE STUDY

### UBS INVESTMENT BANK ESTABLISHES GLOBAL INFRASTRUCTURE FUND

The Australian arm of investment bank UBS has recognised the potential of the infrastructure boom, targeting co-investments with infrastructure clients and launching a global infrastructure fund out of its asset management group. The push into infrastructure is part of new chief executive Brad Orgill's vision for the company. UBS is a recent entrant to a market that has made hundreds of millions of dollars for Babcock & Brown and Macquarie Bank. UBS's asset management arm is launching a global infrastructure securities fund.

"It will be set up and managed in Australia," chief executive of UBS's asset management group in Australia, Colin Woods, said. Later, Mr Woods said, UBS would establish Cayman Islands-based and Dublin-based vehicles for offshore investors. The fund would invest in the US\$2.3bn to US\$2.6bn global universe of infrastructure stocks as well as listed infrastructure debt. UBS expects the fund to grow to between A\$400m and A\$500m over the next three years and it already has preliminary commitments of between A\$50m and A\$60m. The fund will take a bottom-up approach to selecting its investments, focusing on cash flow above all else. It will charge a flat 0.95 per cent fee. In another sign of the growing competition, a British publication reported recently that Goldman Sachs was preparing a \$US3bn (A\$5bn) direct investment fund, designed to help the investment bank's institutional clients invest in infrastructure. (The Australian, 31 October 2005)

European Infrastructure Assets have been particularly attractive to the Australian (and, incidentally) North American funds. Favourable utilities and transportation regulatory systems and opportunities to invest in the growing Public Private Partnerships (PPPs) market have contributed to increased investment in Europe. Macquarie Infrastructure Group and Babcock and Brown have significant interests in Europe as well as diversifying their asset base globally.

## FURTHER IMPLICATIONS RELATING TO THE EVOLUTION OF MARKETS

We believe the particular relevance for Australian state governments is as follows:

- The sophistication of the UK market currently, and in future, or those markets which are most likely to grow in sophistication most rapidly (notably the USA) will become very attractive for such Australian capital as is dedicated to infrastructure assets.
- On the upside, Australia is already a relatively sophisticated market in the global sense. The more it continues to develop, the more the market deepens, the more beneficial it will be for Australian governments – because deeper, more sophisticated markets tend to mean greater competition and lower prices/better terms for the development of infrastructure.

## Chapter Four

### Why should the public sector consider private participation?

#### Summary

There are historic and compelling reasons why the public sector should fundamentally manage the process by which critical infrastructure is provided at state and national level.

A review of the various academic, regulatory and business studies performed on PPP's around the world (including in the UK, the USA, and Australia) in the last ten years highlights that private sector participation, if structured appropriately and to mutual benefit at the discussion/contract/tendering stages, offers potential benefits beyond the supply of an alternative funding source. These include:

- PPPs can result in significant cost savings;
- PPPs enable states to build projects sooner;
- Cost and time savings from innovative project management;
- PPPs allow for the allocation of risk to the party best able to manage that risk;
- PPPs encourage innovations and incorporation of life cycle costs;
- Access to the latest technology;
- Better customer focus; and

- Economically sound decision-making.

There are obviously some risks and challenges involved, but it is well worth the effort of addressing these.

#### Traditional procurement considerations

Around the world, the respective roles of the public and private sectors in the procurement of infrastructure assets have come under the spotlight.

The Mott McDonald Report titled – “Review of Large Procurement in the UK, Report for H.M. Treasury, 2002”, reviewed the outcome of 50 large public procurement projects in the UK over the last 20 years. Its conclusions as to the major deficiencies in traditional public procurement, were:

- inadequacies of the business case;
- disputes and claims;
- complexity of the contract structure;
- late contractor involvement in design; and
- adverse environmental impacts.

Other reviews have pointed to additional perceived failings in the project initiation stages including:

- overestimation of patronage and failure to capture anticipated benefits;
- underestimation of operating expenditures; and
- poor strategic planning.

(National Audit Office 2004a & b)

With regard to these comments, it is worth considering the arguments for public sector procurement.

#### Should the public sector manage the public's infrastructure?

It is widely argued that the public sector is in the best position to provide infrastructure. Proponents view the public sector's advantages to include:

- the strategic importance, and status, of infrastructure as an essential service;
- the superior position of government with respect to its ability to plan and co-ordinate infrastructure supply in the broader interests of both the community and the economy;

- only government is in the best position to design the framework of vertical equity considerations including Community Service Obligations ('CSOs'), transfer pricing benefits, the cross-subsidisation of services and ensuring supply in uneconomic service areas that are part and parcel of infrastructure service provision (Lewis et al. 1998, p. 53f);
- to the extent that infrastructure possesses the status of public or quasi-public good with wide externalities that affect the economy as a whole, it is argued that the public sector should be responsible for infrastructure provision; and
- an advantage of government infrastructure provision is that infrastructure networks frequently involve access and right of way in relation to public and private property. This is difficult to achieve for the private sector, which might be required to enter into negotiations with all affected landowners. The public sector can legislate for right of access, which is important with network utilities that require the laying of pipes and cables, the construction of transmission towers and the transport systems requiring rail or other permanent structures that encroach on Crown lands.

## Different Strengths of Public and Private Sectors

These advantages need to be viewed in the context of complex infrastructure provision. On the one hand, there are strong arguments that Australia needs better long-term infrastructure planning, co-ordination between jurisdictions and strategic management. These areas are the domain of the public sector.

However, project delivery, asset management and financial performance are more likely to be areas of distinct competitive advantage for the private sector. The Government in the United Kingdom notes:

*There are some things which the private sector does best and others where the public sector has more to offer. The old argument, as to whether public ownership was always best or whether privatisation was the only answer, is simply outdated. The U.K. Government firmly believes it will only deliver the modern, high quality public services that the public want and increasingly expect if it draws on the best of both public and private sectors.* (H.M. Treasury 2000)

## Perceived benefits of private investment

Around the world, this perception – that the private sector is better able to deliver more operationally/financially efficient services to the community, at lower cost – has driven much of the enhanced involvement of non-public money in infrastructure investment.

Evidence produced by the various studies referred to in this paper suggests that *when well executed*, Public Private Partnerships (PPPs) allow for significant risk transfer to the private sector, protecting taxpayers from risk and ensuring that the parties best able to manage risk are focused on managing and mitigating them<sup>23</sup>.

In Australia, The Fitzgerald Review 2004 (Review of Partnerships Victoria Provided Infrastructure) identified “the objectives of having a PPP channel for infrastructure procurement” as follows:

- improved service outcomes;
- better value for money;
- appropriate risk transfer;
- innovation;
- greater asset utilisation; and
- integrated whole of life asset management.

It concluded that, “Against that list it can be said that the eight projects evaluated during this review... have provided evidence of the potential benefits from PPP’s.”

AusCID (quoted variously below) considered the following broad risk/efficiency categories in their submission to the NSW Parliamentary Inquiry into Public-Private Partnerships, October 2005:

**Risk allocation:** *One of the fundamental benefits of adopting a PPP approach to project delivery is the reduced level of risk to which the State, and taxpayers, are exposed. Where appropriate risks are transferred to the private sector the contingent liabilities to the State are reduced.*

It is worth illustrating the way risk allocation can work. Professor Mervyn Lewis developed the following matrix in his paper on “Risk Management in Public-Private Partnerships”. This is a general framework and the types of risk obviously vary from project to project<sup>24</sup>.

**Earlier project delivery:** *While the State is capable of procuring most projects directly, often funding*

constraints and interface difficulties with private building contractors lead to delays that are not necessary. Experience has shown that projects that are designed and constructed or, even better, designed, constructed and financed by the private sector, are delivered consistently earlier than they would have been if they had been procured by traditional methods.

The rationale here revolves around incentives. PPPs are incomplete in terms of contract<sup>25</sup> and as it is difficult to foresee and contract about uncertain future events, it is important to get the incentive structure right<sup>26</sup>.

The issue is considered by Grimsey & Lewis (2004):

*...Any workable incentive scheme is almost certain to be one in which the supplier bears much of the risk, on the grounds that those with money at risk have an incentive to make the best decisions. Shifting risk and responsibilities on to the private contractor under a*

*PPP, while gearing payment only to successful delivery of the service, sends out a powerful message that time and cost overruns and service quality lapses are not to be tolerated and they put the remuneration system at risk.*

**Enhanced efficiency:** *It has been widely documented that when there are competitive pressures from a marketplace or competitive tendering, the private sector usually delivers capital works for a lower cost than for public procurement options. This enhanced efficiency is also present when private companies operate and maintain assets. The reasons for this are many but include the greater accountability and financial discipline of private sector firms and the desire to maximise shareholder profits...*

The transfer of responsibility to the private sector under a PPP, encourages it to choose designs that will work, and to explore innovations that can improve quality and reduce maintenance and

**TABLE 7: RISK MATRIX FOR PUBLIC – PRIVATE PARTNERSHIPS**

TYPE OF RISK	SOURCE OF RISK	RISK TAKEN BY
<b>Site risks</b>		
Site conditions	Ground conditions, supporting structures	Construction contractor
Site preparation	Site redemption, tenure, pollution/discharge, obtaining permits, community liaison	Operating company / project company
	pre-existing liability	Government
Land use	Native title, cultural heritage	Government
Technical risk	Fault in tender specifications	Government
	Contractor design fault, Construction risk	Design contractor
Cost overrun	Inefficient work practices and waste of materials	Construction contractor
	Changes in law, delays in approval, etc.	Project company/investors
Delay in completion	Lack of coordination of contractors, failure to obtain standard planning approvals	Construction contractor
Failure to meet performance criteria	Quality shortfall/defects in construction / commissioning tests failure	Construction contractor/project company
<b>Operating Risk</b>		
Operating cost overrun	Project company request for change in practice	Project company / investors
	Industrial relations, repairs, occupational health and safety, maintenance, other cost	Operator
	Government change to output Specifications	Government
Delays of interruption in operation	Operator fault	Operator
	Government delays in granting or renewing approvals, providing contracted outputs	Government
Shortfalls in service quality	Operator fault	Operator
	Project company fault	Project company / investors

operating costs. When the responsibility for construction and project management also vests with the private sector, this provides additional incentive to maintain project milestones and prevent construction and cost overruns.

Finally, having the private sector finance the project means that financiers will seek security and timeliness of the revenue stream, and put in place controls over the operators that will minimise the risk of project failure<sup>27</sup>.

**Better customer focus:** *In a PPP environment, the private contractor depends on continued use of the services it provides in order to maintain profits. As a result, private firms focus on the customer. This service ethic leads to better quality services for infrastructure users.*

**Access to broader funding and risk distribution:** *Private sector organisations have access to broader sources of capital, and more ability to spread the risk, than governments, which are generally restricted to issuing guaranteed bonds and hence pass on all project risks to taxpayers. The ability of the private sector to use structured finance allows project risks to be allocated to investors with an increased appetite for risk and therefore helps to reduce overall funding costs.*

**Whole of life approach:** *Traditional models of asset procurement separate the design, construction, operation and sometimes maintenance tasks. This can lead to conflict between the parties responsible for each role and inefficient outcomes. One of the perceived advantages of PPP projects is that they can be structured so a single party is responsible for designing, constructing, operating and maintaining the asset. That party is required to assess the asset on a whole of life basis. This means that trade-offs between investments during the various life cycle stages of the asset need to be considered. Ultimately, this leads to lower cost services for consumers.*

An objection can be raised that PPPs are still a relatively new phenomenon. Using the UK as an example, the majority of projects commenced after 1997 and with schemes generally extending to 25–30 years, we are yet to see whether they are effective over the whole life of the contract.

**Access to latest technology:** *Private sector organisations, which deliver infrastructure services, tend to be reasonably large and are often multinational. These firms often have extensive experience in operating infrastructure elsewhere. They may have access to operating philosophies and patented technology, which would not be available to the government if the project was undertaken within the public sector. By involving private organisations in the*

*delivery of services, the quality and standard of those services may therefore be improved.*

In addition, the private sector is able to bring a level of technical sophistication to modern infrastructure, which is sometimes unable to be delivered by state-run entities. For example, building a modern water treatment plant or building a free-flowing fully electronic toll road.

## Private sector procurement – a review of the evidence

The following section provides a summary of some of the findings of the various PPP review studies which have taken place around the world. There is plenty of evidence to suggest that PPPs can add value through participating in infrastructure provision. Following sections consider some of the challenges involved in PPPs.

### TRADITIONAL VERSUS PPP/PFI PROCUREMENT: UNITED KINGDOM FINDINGS

#### *Pricing/feasibility*

- In the United Kingdom, Mott McDonald (2002) reviewed the outcome of traditional public procurement projects in the United Kingdom over a 20-year period. The study used a sample of 50 projects over £40 million in value (2001 prices). The review identified a high level of optimism in project estimates arising from underestimating project costs, completion periods and operating costs, and overestimating project benefits. The optimism bias was greater in equipment/development undertakings and non-standard civil and construction projects (Mott McDonald 2002).
- The optimism bias was much lower with PPP projects and this was attributed to the more comprehensive process involved with costing and negotiating PPP projects, and the transfer of cost and delay risk to the private sector.

#### *Cost performance*

- As shown in Table 8, inquiries by the United Kingdom National Audit Office identified cost overruns in 73 per cent of traditional construction projects (NAO 2003a). By contrast 78 per cent of PPP projects were within budget. Of the 22 per cent of PPP projects that experienced cost overruns, these were principally the result of changes to specification or variations instigated by a public agency or third parties. The cost overrun in PFI contracts was, on average, less than the amount incurred under traditional procurement (NAO 2003a, p. 2).

- 70 per cent of traditionally procured projects were subject to late delivery. Only 24 per cent of PFI projects were late.

**TABLE 8: PFI CONSTRUCTION PERFORMANCE**

	TRADITIONAL PROCUREMENT	PFI PROJECTS
Cost Overruns	73%	22%
Late Delivery	70%	24%

NOTES: Cost overrun incurred by agency specification change Completion delay over 8 weeks was 8 per cent of sample

Source: NAO 2003a, pp. 2–3 , using 2002 census data

The Report goes on to state:

*There is strong evidence that the PFI approach is bringing significant benefits to central government in terms of delivering built assets on time and for the price expected in the public sector (National Audit Office 2003a).*

#### TRADITIONAL VERSUS PPP/PFI PROCUREMENT: US FINDINGS

The following US data is sourced from the US Department of Transportation Report to Congress on Public-Private Partnerships (December 2004).

**Cost and Time Savings:** *Evidence of the financial benefits of public-private partnerships has ... been collected by the Florida Department of Transportation (Florida DOT), one of the States actively utilizing innovative contracting methods. The Florida DOT compared traditional low-bid contracts with those awarded using seven different non-traditional methods.*

**TABLE 9: FLORIDA COST AND TIMES OVERRUNS**

NON-TRADITIONAL CONTRACTING TECHNIQUE	CONTRACT #S	CONSTRUCTION AWARD \$M	% COST OVERRUN	CONTRACT DAYS	% TIME OVERRUN
A + B (cost-plus-time)	9	48.5	3.5	2,283	8.1
No Excuse Bonus	8	31.0	7.2	2,110	1.5
Incentive/Disincentive	12	28.6	8.4	2,835	5.8
Lane Rental	8	16.8	-4.1	1,535	5.7
Liquidated savings	9	18.2	-1.8	1,171	13.2
Bid Averaging	2	17.2	4.5	973	7.2
Lump Sum	8	7.7	-0.7	915	16
<b>All Non Traditional Contracts</b>	<b>56</b>	<b>168.0</b>	<b>3.6</b>	<b>11,639</b>	<b>7.1</b>
<b>Traditional Low-Bid Contracts</b>	<b>375</b>	<b>1,162.0</b>	<b>12.4</b>	<b>87,861</b>	<b>30.7</b>

Source: The US Department of Transportation , Report to Congress on Public-Private Partnerships (December 2004)

*In every case, the non-traditional method had lower cost overruns and was delivered closer to schedule than the average traditional low-bid contract.*

*Although Florida DOT acknowledged that there are cost and time overruns with projects executed under innovative contracting methods, the magnitude of these overruns is significantly reduced. Traditional low-bid contracts on average had 12.4 percent cost overruns while non-traditional contracts on average had only a 3.6 percent cost overrun. Refer Table 9.*

**Innovation and Cost:** *In February 2003, Battelle, on behalf of Koch Industries, compared the use of traditional methods of contracting to the use of innovative contracting methods. Although data comparing the use of innovative contracting with traditional procurement is rare, the case studies reviewed by Battelle found that the use of performance-based contracting, a form of public-private partnership, can result in cost savings ranging from 6 to 40 percent.*

**Innovation and Quality:** *Innovative contracting methods often give the contractor additional freedom to decide the best method and material for the project, while the State highway agency provides the direction on the performance, schedule and cost. Greater flexibility and less rigid prescriptive specifications give the contractor freedom in other areas of the project.*

*The departure from the traditional contracting approach allows designers and builders to take advantage of the advances in technologies and techniques relating to construction materials, equipment, and design methods. These innovative techniques and materials improve the quality and reduce the duration of the construction project, and normally result in lower life-cycle costs.*

Quality is difficult to measure in highway construction because of the unusually long life of the asset being constructed. Public-sector partners can measure quality over the life of an asset but quality is difficult to gauge immediately after the road is constructed. The Wisconsin DOT ... have studied innovative contracting and its impact on quality. The Wisconsin DOT explored the relationship between quality and whether or not the project had a warranty. As [Table 10] demonstrates, warranted pavements performed significantly better.

The Wisconsin DOT study indicates the warranted pavements are performing better than similar non-warranted pavements based on the measured International Rough Index (IRI) and Performance Distress Index (PDI). The IRI is an indication of surface smoothness and is measured in inches per mile or meters per kilometer (sic). A PDI of "0" indicates a pavement in perfect condition and "100" represents the worst condition.

TABLE 10: QUALITY BETWEEN WARRANTED AND NON-WARRANTED PROJECTS IN WISCONSIN

PERFORMANCE INDICATORS	PAVEMENT AGE			
	NEW	1 YRS	2 YRS	3 YRS
Stated Average IRI – Non Warranted	1	1.12	1.29	1.36
Average IRI – Warranted	0.8	0.83	0.79	0.8
Stated Average PDI – Non Warranted	0	4	11	18
Average PDI – Warranted	0	2	5	8

Source: The US Department of Transportation, Report to Congress on Public-Private Partnerships (December 2004)

## PPP PERFORMANCE AGAINST THE PSC

### UK data

The National Audit Office (NAO) reported:

- average procurement savings of 20 per cent against the PSC (NAO 2001); and
- noticeably improved service quality levels.

In a 2000 study to the UK Treasury taskforce, Arthur Andersen<sup>28</sup> calculated that the average percentage estimated saving against the PSC in favour of using the private sector was 17 per cent. We note that the project savings identified in this case were sensitive to risk transfer valuation, which accounted for 60 per cent of forecast cost savings.

### Australian data

In Australia, a number of studies have examined procurement cost savings against the PSC.

- Bureau of Transport and Communication Economics in 1996 showed the average procurement savings to be 15 per cent compared with traditional procurement
- The Fitzgerald review examined 8 PPP projects in Victoria in 2004 and identified an average 9 per cent cost saving against the risk-weighted public sector comparator.

### Global data

A global review of procurement cost savings against the Public Sector Comparator is presented in Table 11.

TABLE 11: REVIEW OF PROCUREMENT COST SAVINGS AGAINST THE PSC

STUDY	REVIEW FINDINGS	LOCATION
BTCE 1996	15% (contracting out)	Australia
Hodge 2000	8–14% (contracting out)	Global
UK Treasury 1998	17%	UK
Andersen/Enterprise LSE 2000	17%	UK
UK Treasury 2002–03	19.7% (all procurement)	UK
Allen HOC 2003	10% (buildings only)	UK
Fitzgerald 2004	9%	Australia
Auditor-General Victoria	0.5% (Traffic Forecasts – but pricing low)	Australia

Source: Regan 2007, Wilson HTM

## Balance sheet considerations

There are a number of issues with respect to Balance Sheet Management that have refocused the public sector on models for private sector procurement. These are discussed below.

### GOVERNMENT DEBT LEVELS

In many parts of the world, as well as in Australia, public debt is at, or close to, historical lows with some governments running fiscal surpluses. Governments in general are now more reluctant to take on the levels of debt needed to replenish the nation's infrastructure than they were in the past, or they are at least sensitive to ensure that where spent, public money is being best utilised vis-à-vis the

other potential uses to which it could be put, for example health, education, welfare and defence.

## Risks and challenges of Public-Private Partnership procurement

Most of the available studies identify the benefits of using PPP's. However, we are not of the view that PPP's are 'simple' to facilitate, and we are not seeking to present them as a panacea.

The following risks and challenges are described by the Florida Department of Transportation (DOT):

**PPP's do not always result in cost savings:** As demonstrated in Table 9 Florida's use of innovative contracting resulted in cost overruns more often than they resulted in cost savings. (But the degree to which over-runs were incurred was much below those for traditional procurement).

**PPP's do not always create time savings:** Again, Table 9 shows that innovative procurement methods, including those directly providing incentives for on-time delivery, often failed to be completed when required. And when PPP's do create time savings on a project basis, it can be at the expense of other projects. For example, contracting methods designed to focus contractors on the importance of completing projects in a timely manner can produce an increased burden on the resources of State agencies, even when effective. Extended work hours may be required to provide appropriate inspection of the project and training of personnel. States using public-private partnerships have experienced an initial sharp increase in workload as they adapt their procedures for guaranteeing the timeliness, efficiency, and safety of a project to fit the unusual requirements of public-private partnerships. Virginia, for example, experienced a noticeable increase in the amount of time senior officials spent on projects built under the Public-Private Transportation Act of 1995.

**Quality impacts:** The shortened schedule and the increased control of the contractor could lead to lower quality because the public sector partner typically has less of an opportunity to design and inspect the project.

**Private sector difficulties:** Smaller contractors and designers have expressed concern that it is difficult for them to bid on public-private partnership work because the projects tend to be larger than their firms can manage. PPPs also tend to shift risks away from the public sector and toward the private sector. This shift in risk can frequently be so

significant that smaller firms are not able to absorb it, and as a result, cannot bid on the work.

**Private sector funding does not always ensure financial solvency:** When the project financing is secured by tolls or other revenue streams from the project. Sometimes public use is not as high as projected, resulting in revenues that are inadequate to pay off the debt on the project. An example of this is the Dulles Greenway, a project that was initially financed with equity contributions from the TRIP II partnership, bank loans, and long-term, fixed rate notes. After construction costs of roughly \$340 million, the project ran into financial troubles. Traffic and revenues were initially lower than expected, in part due to improvements made by the State to a competing road, State Route 7. As a result, TRIP II went into default on its loans and note agreements in 1996. Refinancing occurred in 1996, allowing it to create project reserve funds and issue \$370 million in senior bonds and \$76 million in subordinate bonds. While the project is still yet to make a profit for its investors, development in the area is increasing and bringing with it increased usage of the Greenway.

These negatives are presented to the discussion out of a desire for objectivity. They crystallise earlier references to the fact that no two projects are the same, and point to the requirement for an environment of open cooperation between private and public sectors. Still, it is reasonably clear from numerous data sources that, if PPP's can be appropriately structured at the discussion/ contract/ tendering stages, these partnerships can deliver mutual benefit to both sides.

## Chapter Five

### Private sector participation – frameworks

#### Summary

Public-Private Partnerships have many different forms and this section seeks to provide a broad overview of the range of models employed around the world. Form varies across asset procurement options, payment mechanisms, asset classes, etc. There is no one correct solution for all types of infrastructure projects and situations.

But all PPPs have similar objectives, namely:

- to allocate risks between public and private sectors to those parties best positioned to manage them;
- to increase cost savings resulting from improved procurement procedures and efficient service delivery;
- to enhance the quality of services delivered to the public;
- to generate reasonable profits to the private sector participants; and
- to free up government fiscal funds for use in other areas.

The government has, and always will have, an important role to play. At the same time, the private sector can make a major contribution, and there is a major 'win-win' for both the public and the private sector if the skills and capabilities of each can be harnessed by them working together in ways which play to the strengths of each.

Clarity of government requirements, an absence of undue complexity, and an attractive enabling environment will play a major role in bringing this about.

#### Public-Private Partnerships (PPPs)

##### DEFINITIONS

Public sector procurement models, which facilitate private sector participation, have typically come under the mantle of some form of Public Private Partnership (PPP).

PPPs originally arose in the United Kingdom (UK) in the late 1980s and early 1990s and have been adopted in Australia, Europe, Canada and many other countries. The structure is starting to gain

popularity in the US, with a number of states implementing or in the process of considering PPP frameworks, and with activity potentially greater than US\$1000bn.

Distinguishing between privatization and PPPs is important. The terms privatisation, PPPs and procurement are often used interchangeably, as seen in Lam (2004),

*The biggest difference between the traditional methods of privatisation and the PPPs is that the private sector under the PPPs model has to be willing to take on more risk than they would normally do with a government contract (Lam 2004).*

In our view, the key differences are:

- **Privatization** typically involves the selling of government assets, especially industrial capital to the private sector (see Routledge 2002, p.467). The government sells its ownership stake in a public utility through either initial public offering (IPO), trade sale or management buy-out (MBO) and the new owner has freedom to deal with the assets as it pleases. As a result, the government retains significantly less power and influence over the use of assets and the quality of services provided by the private sector.
- **PPPs** – under PPP/PFI, and depending on the Public-Private partnering arrangement entered into by the respective parties, the contract provided to the private sector consortium is for a fixed term after which the public asset normally returns to public ownership. The PPP payment mechanism provides the government with the power to withhold or deduct payments if the service quality provided by the private sector is lower than agreed. Furthermore, the government also normally reserves the right to step in and regain direct control in the event of a repeated default in service provision by the private sector operator. PPPs usually involve the creation and hence delivery of new infrastructure assets or essential public services in partnership with the private sector.

A widely accepted definition of PPPs does not emerge from the literature nor has it been defined by industry. In this regard, see comments by Frits Bolkestein, the EU Commissioner for Internal Markets,

*There is no overarching definition for public-private partnerships. PPP is an umbrella notion covering a wide range of economic activity and is in a constant evolution.*

These views are consistent with Regan (2005).

There are many variations of the public-private partnership model. They vary with the level of involvement of each party based on their respective skill and capability to deliver the project and manage the asset post delivery on an on-going basis.

As such, it is perhaps better so see the PPP's as a set of combinations of interest between public and private sector, organised along a spectrum between conventional government ownership and operation, all the way through to full privatisation.

The structure may vary by asset class and the specifics of the project – i.e. level of risk transfer assumed between the private and public partners.

In its report to Congress on Public-Private Partnerships (December 2004), the US Department of Transportation defines a PPP as follows:

*A public-private partnership is a contractual agreement formed between public and private sector partners, which allows more private sector participation than is traditional. The agreements usually involve a government agency contracting with a private company to renovate, construct, operate, maintain, and/or manage a facility or system. While the public sector usually retains ownership in the facility or system, the private party will be given additional decision rights in determining how the project or task will be completed.*

*The term public-private partnership defines an expansive set of relationships from relatively simple contracts, e.g., A+B contracting, to development agreements that can be very complicated and technical, e.g. design-build-finance-operate-maintain.*

*... the term public-private partnership is used for any scenario under which the private sector would be more of a partner than they are under the traditional method of procurement. Further, this broad definition of public-private partnerships includes many elements that are being utilized on a more routine basis.*

*Public-private partnerships usually involve a government agency contracting with a private company to renovate, construct, operate, maintain, and/or manage a facility or system. While the public sector usually retains ownership in the facility or system, the private party will bear additional risks or be given additional decision rights in determining how the project or task will be completed.*

*The term public-private partnership defines an expansive set of relationships from relatively simple contracts, such as contracts where the private sector assumes the risks of delays in schedule through financial incentives and penalties. On the other end of the spectrum, it includes very complicated and technical development projects, where the private sector builds, owns, and operates a transportation facility.*

## Broad forms

The US Department of Transportation states that:

*Public-private partnerships generally fall into one of five categories, based on the reasons for their creation.*

*The five key public-private partnership categories are:*

- 1 Partnerships designed to accelerate the implementation of high priority projects by packaging and procuring services in new ways

FIGURE 1: INFRASTRUCTURE FUNDING MODELS INVOLVING THE PUBLIC AND PRIVATE SECTORS



Source: Wilson HTM, adapted from KPMG

- 2 *Partnerships that turn to the private sector to provide specialized management capacity for large and complex programs;*
- 3 *Partnerships focused on arrangements to facilitate the delivery of new technology developed by private entities;*
- 4 *Partnerships drawing on private sector expertise in accessing and organizing the widest range of financial resources; and*
- 5 *Partnerships to allow and encourage private entrepreneurial development, ownership, and operation of highways and/or related assets.*

*Some partnership arrangements may involve several or all of these functions.*

*Regardless of the specific functions involved, partnership arrangements are intended to provide greater flexibility to achieve transportation program objectives by altering traditional public and private sector roles to take better advantage of the skills and resources that private sector firms can provide. (The US Department of Transportation December 2004)*

According to the PWC Global PPP/ Infrastructure Yearbook 2005, the UK government's definition is broad and includes:

- the introduction of private sector ownership into state-owned businesses;
- using the full range of possible structures (whether by flotation or the introduction of a strategic partner), with sales of either a majority or a minority stake;
- the Private Finance Initiative (PFI) and other similar arrangements. Under these, the public sector contracts to purchase quality services on a long-term basis so as to take advantage of private sector management skills, incentivised by having private finance at risk. This includes concessions and franchises, where a private sector partner takes on the responsibility for providing a public service, including maintaining, enhancing or constructing the necessary infrastructure. Construction of new or acquisition of existing public sector assets may be financed through a mix of debt and equity from the private sector and with innovations such as the Capital Guarantee Fund (CGF) also through government<sup>29</sup> (The terms PPP and PFI are used interchangeably, although PFI generally refers to the private sector financing of public infrastructure projects in the United Kingdom); and
- selling government services into wider markets and other partnership arrangements where private

sector expertise and finance are used to exploit the commercial potential of government assets.

(PWC 2005)

## Asset procurement options

The most common procurement options are explained briefly in Table 12.

## Payment mechanisms

There are many variations of the payment mechanism to the private sector. The variant applied depends on the nature of the asset in question. Mechanisms include direct tariffs levied on users, periodic service payments from the government, or a mixture of the two. Periodic service payments will apply to assets and services that the government has traditionally funded through taxation revenues but provided relatively free of charge to the general public (e.g. schools, correctional facilities, public hospital care), provided that predetermined service quality standards are achieved.

For assets where the government currently levies a tariff for usage (e.g. road tolls, electricity, water, gas and other public utility bills), the private sector will continue to generate their revenues in this way. In some instances, the private sector may collect tariff revenue from users and receive government service payments. In other arrangements, the private sector may be required to share tariff revenue with the government and receive no periodic service payments<sup>30</sup>.

## Asset classes

PPP's have been widely applied by asset class – indeed it is erroneous to conceive of the structures as being more or less suited to any particular infrastructure sector group. Grimsey & Lewis, (2004) define the following as asset classes that could be suitable for PPPs:

- transport (road, rail, ports, airports);
- fixed links (bridges, tunnels);
- water resources (filtration plants, irrigation, sewerage treatment, pipeline);
- tourism (facility development);
- health (hospitals and specialised health services);
- specialised accommodation facilities (courts, police stations);

- educational facilities (schools, museums, libraries);
- correctional services (prisons, remand and detention centres);
- arts, sports and recreational facilities;
- convention centres;
- government office accommodation; and
- social housing.

parties' respective skill and capability to deliver the project, accept the various risks, and manage the asset post delivery.

It is a matter of 'horses for courses'. However, this does not mean that complexity and lack of clarity is justified – in fact the contrary is the case – see the sections in this report regarding the importance of an attractive enabling environment, including clarity and an absence of bureaucracy.

Having said that, it is clear from the evidence outlined above that:

- PPPs, in their various forms, can deliver major benefits to the public, provided they are appropriately structured and the government does a good job of working well with the private sector participants, understanding their needs and creating an attractive enabling environment.

## Conclusion

As indicated, there are many variations of the public-private partnership model. There is no one 'correct' solution for all types of infrastructure projects and situations. It is important that a skilful assessment is made, for each type of project, as to the most appropriate level of involvement of each party based on the needs of the public and the

**TABLE 12: POSSIBLE PUBLIC – PRIVATE SECTOR PARTNERING FOR THE DELIVERY OF INFRASTRUCTURE PROJECTS**

CONTRACT TYPE	CHARACTERISTICS
Design & Construct (D&C)	The government specifies the asset it requires in terms of its functions and the governments desired outcomes. The private sector is responsible for designing and building the asset and any related risks. The asset is then passed to the government to operate.
Operate & Maintain (O&M)	An existing, government owned asset is managed by a private sector organisation for a specified period. The contractor will be responsible for providing the services to the customer (retail or wholesale), maintaining the asset to a specified condition and ensuring that management practices are efficient.
Design Build Operate (DBO)	Effectively a design and construction contract and an operation and maintenance contract rolled together. The service provider is usually also responsible for financing the project during the construction period. The government purchases the asset from the developer for a pre-agreed price prior to (or immediately after) commissioning and takes all ownership risks from this time. The contractor retains the management function and related risks.
Build Own Operate Transfer (BOOT)	The service provider is responsible for design and construction, finance, operations, maintenance and commercial risks associated with the project. It owns the project throughout the concession period. The asset is transferred back to the government at the end of the term, often at no cost.
Build Own Operate (BOO)	Similar to BOOT projects, but the service provider retains ownership of the asset in perpetuity. The government only agrees to purchase the services produced for a fixed length of time.
Lease Own Operate (LOO)	Similar to a BOO project but an existing asset is leased from the government for a specified time. The asset may require refurbishment or expansion but no 'new build' assets are necessary.
Alliance	An agreement between the private contractor and the government to share the pain or the gain associated with project risks. The parties agree to a benchmark price, time and service standard and any benefits (or costs) achieved are shared between the parties according to a pre-agreed formula.

Source: 2000, AusCID Legislative Assembly Public Accounts Committee Inquiry into the Funding of Capital Projects by the New South Wales Government

- The government has, and always will have, an important role to play. At the same time, the private sector can make a major contribution, and there is a major ‘win-win’ for both the public and the private sector if the skills and capabilities of each can be harnessed by them working together in ways which play to the strengths of each. This requires each to understand, and to respect, the needs of the other. Crucially, the private sector needs an attractive and efficient enabling environment and processes; the public sector needs the private sector to understand (and to help it realise, in practice) its need to achieve, and to demonstrate, value for money.

## Chapter Six

### Private sector participation – enabling environments

#### Summary

If Queensland is to undertake the enormous task of ensuring that its infrastructure needs are met, and to obtain the benefits of private sector participation in this infrastructure challenge on favourable terms, it must create the right ‘enabling environment’ to generate private sector enthusiasm. This chapter outlines what it needs to do in order to accomplish this. This includes working strongly with, and getting to understand, the private sector groups with the capacity to participate.

In previous chapters we identified the strong desire and ability of private sector groups to invest in infrastructure.

Our conclusion is that there is an enormous potential ‘win-win’ for both the Queensland public and private sector participants (particularly Australian investors, and particularly superannuation funds), if the two groups can demonstrate a strong understanding of each others’ needs. These investors have a strong appetite to invest, and government can obtain major benefits from such investment.

However, the market for the private sector supply of infrastructure is now a global one. And the need for infrastructure provision globally over coming years is enormous. So the Queensland public sector will need to compete strongly by making the state an attractive place in which to do infrastructure business.

And the private sector will need to work to understand the needs of the government and the public, particularly the need to demonstrate ‘value for money’, if it wishes the public to be enthusiastic about private sector involvement. There are ways in which the private sector and the public sector can work together to share the benefits of the resultant efficient provision of infrastructure.

#### Creating the right enabling environment

If Queensland is to:

- obtain the benefits achievable with private sector participation – including lower overall net costs, greater private sector risk absorption, and greater efficiency;
- rely on private sector investment to fill the gap created by the very large infrastructure task ahead, against a desire to avoid massive increases in public sector investment and debt;
- compete in the global market for its desired share of private sector infrastructure funds; and
- secure private sector procurement and investment on attractive terms;

then it is paramount that the conditions required to muster substantial private sector interest and indeed enthusiasm, must be present. Creating the right environment is fundamental to attracting the private sector to the state of Queensland and achieving competitive bidding and therefore good value for money.

A number of Australian and U.S. States have implemented Public Private Partnership guidelines and policies to encourage private sector participation<sup>31</sup>.

For PPP’s to be undertaken, and for programmes of PPP’s to develop in an efficient and effective way, a number of conditions should be present:

- demonstrable, strong, clear long-term political will;
- a good understanding at a political and policy level of what PPP’s are, where they are appropriate and how to use them;
- a rigorous planning process to ensure that the infrastructure is sufficient, and built in the right location, to meet economic growth, sustainability and international competitiveness objectives;
- an understanding, at all relevant levels of government (national, regional and local), of how PPP’s should be structured and procured;

- a co-ordinated public sector institutional capability (incorporating the range of government agencies which impact on infrastructure projects), with the practical capacity to optimally develop and undertake a substantial range of projects and procurements, including complex ones, facilitating appropriate private sector involvement; and
- a suitable framework covering legislative, regulatory, commercial and financial requirements.

Such an environment should not include:

- complex PPP frameworks;
- multi-agency regulation;
- slow or bureaucratic work practices and processes (i.e. 'red-tape'); or
- slow project procurement and complex/expensive tendering processes.

At the same time, the government has crucial needs that private sector participants must appreciate and address. For example, the fact that private sector involvement needs to demonstrate clear value for money from the perspective of the government, its agencies and the public. If the private sector is to become a major part of the provision of infrastructure in Queensland, private sector participants need to work closely with the government agencies responsible for ensuring the delivery of value for money, understand them well, ensure that value for money is in fact delivered, and help demonstrate and communicate the value for money benefits.

People who represent, and understand the needs of, superannuation fund investors as well as other investment funds, structuring companies and project sponsors including construction companies, will need to work closely with a co-ordinating government agency or agencies to achieve this. The natural tendency of each group to focus on its own needs must be replaced by mutual understanding and a common mission to achieve the infrastructure delivery in a manner which satisfies the legitimate needs of each of the parties. People with such experience and knowledge need to be assembled to ensure that the expertise is in place to bring this about.

All parties must be driven, and incentivised, to deliver the desired infrastructure outcomes. This is no small task given the competition, both in other parts of Australia, and globally, for infrastructure provision. Our co-ordination skills need to be at least as good as those in other parts of the world.

## Value for money & PPP policies

### PUBLIC SECTOR COMPARATOR

The rationale for procuring infrastructure service through PPP's is that they can deliver value for money benefits<sup>32</sup>. The primary tool used to demonstrate value for money is the Public Sector Comparator (PSC)<sup>33</sup>. Most state jurisdictions have implemented their own PPP policies using the PSC as a basis for determining whether to proceed with a project for private sector delivery or not.

To achieve value for money a number of factors must be present (Grimsey & Lewis, 2004), including:

- projects are awarded in a competitive environment;
- economic appraisal techniques, including proper appreciation of risk, are rigorously applied, and that risk is allocated between the public and private sectors so that the expected value for money is maximised; and
- comparisons between publicly and privately financed options are fair, realistic and comprehensive.

### COMPETITIVE ENVIRONMENT

A key success determinant of the PPP process is a deep and competitive market of capable bidders to ensure full benefits are derived by the public from the procurement process.

Particularly in an environment of strong (and growing) supply of private infrastructure capital and hence an increased private sector desire to participate in the procurement of public infrastructure, the pricing of privately provided infrastructure will reach a fair equilibrium – attractive both to the private sector providers and to the Queensland public (through its agent, the Queensland government) – if the enabling environment is transparent, competitive and efficient (devoid of excessive cost or bureaucracy). As in any market, that for infrastructure services (in transport, energy, water etc.) will not work efficiently unless all costs and benefits are fully represented and made apparent to users and operators. The best way to achieve this is through the price mechanism.

To obtain the benefit of this, the Government will need to encourage and facilitate maximum private sector interest, with a genuine understanding of the private sector's needs, and close co-operation between the two sectors.

Competition, achieved through well structured, efficient tendering processes, will then ensure fair and attractive pricing, given that private sector enthusiasm is so strong.

The ex-post returns will inevitably prove too high on some projects and too low on others, but that reflects imperfect foresight and changing conditions subsequent to project go-ahead (i.e. like technological improvements, such as electronic toll collection systems on the CityLink and M7 etc., which have been challenging traditional methods of operating infrastructure and allowing a wider application of economically more appropriate pricing mechanisms). Pricing should be fair and attractive from both perspectives, given expectations. Competition will ensure that the private sector group offering the best deal to the government and thus to the public will be the one which earns the right to participate in each project.

In terms of market pricing, investors will not require high equity returns; low beta values, predictable cash flows and diversification benefits mean the value of infrastructure within a portfolio is not solely dependent on out-performing capital growth opportunities.

Success in attracting sufficient private capital will also involve the government actively targeting the plethora of infrastructure participants (sponsors, structuring companies and investment funds) in a strategic way, either in its own right or through suitably qualified parties, to raise awareness of, and ensure maximum interest and thus competition in those of the State's infrastructure projects which are primarily suitable for private sector procurement.

The Airport Link seems to be an example of government facilitating a competitive environment. Here the Queensland state government solicited overseas interest to increase the level of bid competition to the three bidders who were initially understood to be preparing to tender for the project.

Those who initially expressed interest in the Airport Link involved two Leighton companies:

- Northern Motorway Consortium comprising Leighton Contractors and ABN Amro; and
- BrisConnections Consortium comprising Macquarie Bank and Leighton Holdings Ltd.

and the third, an Australian/overseas consortium:

- NorthConnect Motorway Pty Ltd comprising Bilfinger Berger AG units Baulderstone Hornibrook, Abigroup and Bilfinger Berger Civil, as well as Babcock & Brown Ltd., Coffey International Ltd<sup>34</sup>.

Encouragingly a fourth bidder – Iridium Concesiones de Infraestructuras and Dragados SA, both units of Spanish conglomerate ACS Group – has expressed interest in developing the project.

A preferred developer is expected to be named in June, with construction beginning by late 2008.

#### *Australian Superannuation Funds – a special class of investor, worth special government effort*

The needs of the institutional investors such as superannuation funds may need to be better understood if their enthusiastic participation is to be obtained. As indicated in Chapter 3, superannuation funds have some special needs which need to be recognised and addressed. For example, being trustee organisations superannuation funds have special governance requirements and tend to make extensive use of specialist advisers. In addition to superannuation funds' unique needs, they have the same needs as other investors (i.e. for an efficient, transparent facilitation environment etc). These funds may need to work with specialist organisations which can help them locate desirable infrastructure assets and participate in the government PPP processes e.g. bidding as part of a consortium.

### **Further issues for government**

There are a number of further issues which any government must address, if it is to achieve maximum value for money, namely:

- Whether the Government's PSC will allow the private sector to earn an acceptable return on an asset, and whether it can foster a collaborative environment which can attract sufficient private capital?
- To obtain the benefit of attractive infrastructure provision and pricing – which is likely, given that private sector enthusiasm is so strong – the Government will need to encourage and facilitate maximum private sector interest, with a genuine understanding of the private sector's needs, and close co-operation; in particular, transparent, competitive and efficient PPP processes (devoid of excessive cost or bureaucracy). Is it up to this task?
- Does the public sector have sufficient knowledge and expertise to run the bid process and assess

value for money issues (in addition to the PSC), including the ability to ensure:

- economic appraisal techniques, including proper appreciation of risk, are rigorously applied, and that risk is allocated between the public and private sectors so that the expected value for money is maximised; and
- comparisons between publicly and privately financed options are fair, realistic and comprehensive?
- Does the public sector have sufficient knowledge of the global PPP landscape, project sponsors, investors, debt capital markets, etc, to ensure that it delivers value for money for Queensland?
- Whether the public sector should consider appointing a private sector advisor or advisors to help run its PPP procurement programs, as other governments have overseas?

### **Partnering with government through innovation**

A criticism of private provision of infrastructure is that it is more costly than provision by the state. It is argued that most private companies have a weaker credit rating than the state and this translates into higher debt costs, particularly for highly leveraged long-term investments. Private sector equity hurdle rates are also greater because they need to be risk-weighted. The state's risk can (ultimately) be indemnified by taxpayers and, with the exception of PPP's which do recognise state project risk, the discount rate is the state's cost of capital. In Australia, the proxy for this is generally the 10-year commonwealth bond rate.

The fact that the state has stronger credit ratings, and thus lower debt costs, is not in itself a valid criticism of private sector infrastructure involvement. The credit ratings and associated debt costs reflect the fact that private sector risks are fully reflected in pricing whereas much public sector funding places project risks on tax-payers generally, in a non-transparent way. There are, in fact, significant benefits (including enhanced resource allocation efficiency) if infrastructure risks can be made more explicit and reflected in pricing to users.

The cost of capital is one of the key components of price regulation in Australia. In the United States and Japan, rate of return regulation is used exclusively to set output prices for most utilities. If the financial and operational performance of infrastructure was solely determined on the basis of the cost of capital, the state would have a decided advantage. However, in the 30 to 40 year economic

life of most infrastructure projects, many other factors enter the equation – efficient and motivated management, lifecycle costing, risk allocation, pricing, innovation and new technology.

If infrastructure is to operate more efficiently, combining public capital with private delivery and management may in some cases be optimal.

In 2003–04, the United Kingdom introduced a credit guarantee fund (CGF) for PPP projects. In the pilot program, the UK government borrowed directly from capital markets to provide a pool of debt capital to be on-lent to specific projects. The debt was advanced against the guarantee of the private consortium's financial arrangers and/or lenders with first-ranking or senior debt status. The private arrangers/lenders provided the second-ranking or junior debt and equity underwritings as required. At the project level, the program has been successful in balancing two competing priorities. First, state intervention has reduced the cost of debt capital for the project. Second, the project's credit risk remains with the private guarantors and this keeps the incentive with the consortium to efficiently deliver infrastructure services at the lowest cost. The UK CGF model may provide a practical alternative for the provision and management of major infrastructure in either PPP or traditional procurement forms. The structure of the CGF is provided below.

We are not advocating the adoption of a Credit Guarantee Fund for Queensland. We have simply described it as an example of how (once they understand each other well) government and the private sector can find ways to partner together, with each adopting the role where they have the greatest contribution to make.

### **Can the public sector share in the returns the private sector generates from infrastructure projects?**

A key criticism of PPP models for public infrastructure procurement is that the private sector can extract significant value from infrastructure projects without having to consider or pass on any of this value to the public authorities or the State.

Opportunity exists for the public sector to participate in private sector infrastructure transactions.

A number of government investment groups have invested alongside project sponsors and investment companies. The Queensland Investment Corporation (QIC) and the Singapore

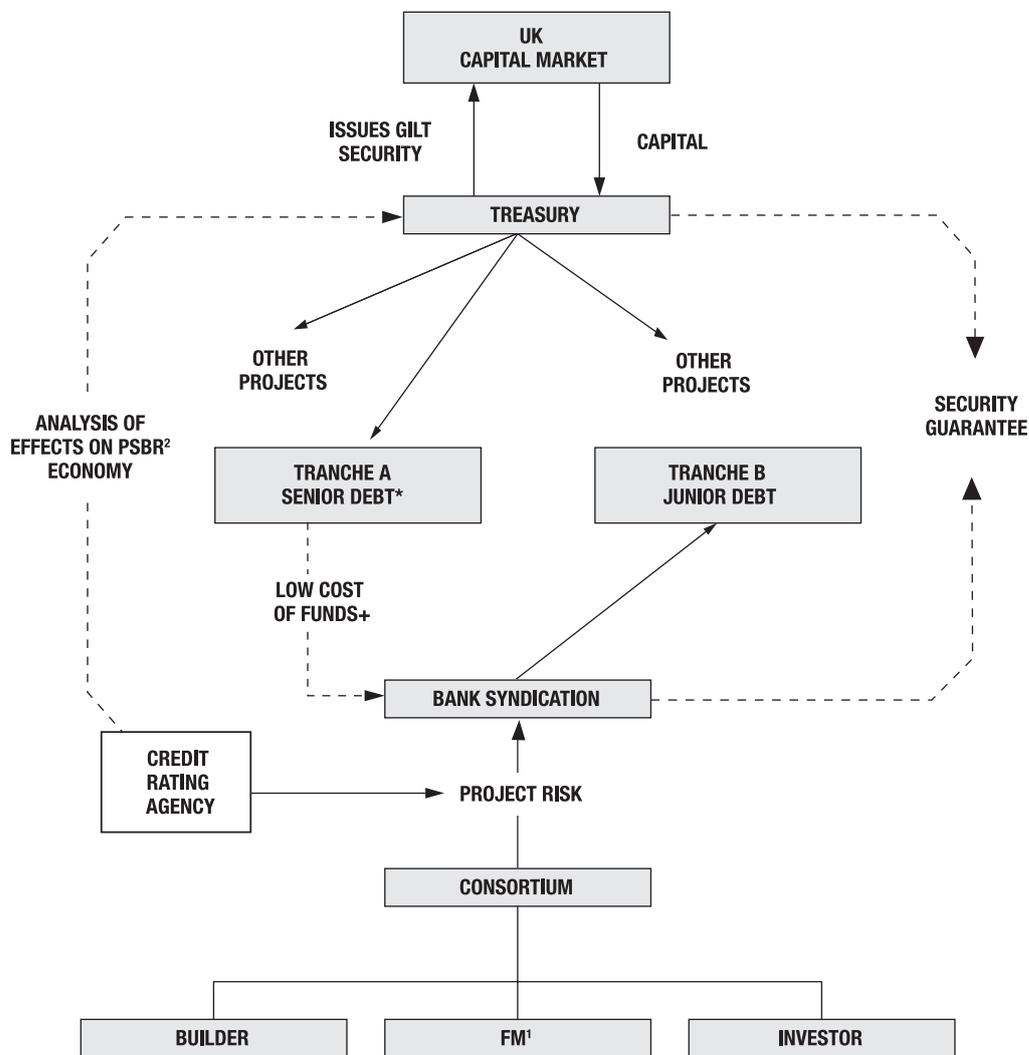
Government's private investment arm have participated in the financing of numerous infrastructure projects including the Brisbane Airport and Thames Water. In the UK and Victoria, the public sector takes a pre-determined share of revaluation gains, the manner by which is discussed below.

In essence, it is a government policy decision as to whether all value or gains generated from a project, above those needed to entice the lowest bidder in competitive tender to proceed with the project, are applied for the benefit of the users of the infrastructure (e.g. as lower usage charges) or taken by government in some way (for use in the

provision of other services or distribution to the public as lower taxes).

PPP's can generate windfall gains for government. The early experience with PPP's in the United Kingdom indicated that there were financial gains to be made by private investors who refinanced their project following the early 'ramp up' period after which revenue, variable costs and net earnings before interest, tax, depreciation and amortisation (EBITDA) stabilise. Revaluation of a finite tenure infrastructure project during the first third of the holding term generally gives rise to a capital gain. This is achieved with the de-risking of the original PPP transaction following construction,

FIGURE 2: CREDIT GUARANTEE FINANCE MODEL



Notes: \* Refinancing requires consent +7-10 per cent Cost of Funds ('COF') reduction  
 1 FM – Asset Manager  
 2 PSBR – Public Sector Borrowing Requirement

Source: Regan 2006

commissioning and the resolution of early stage operational and management matters. The project is re-valued, debt is refinanced and, unless the franchise requires a minimum equity subscription, equity may be withdrawn and/or a significant distribution paid to equity holders. The refinancing against higher investment value means that debt may be increased, the term extended and the interest cost reduced (NAO 2005a). Unless the PPP transaction has a minimum equity requirement, investors may repatriate equity capital and take their capital gain.

In the United Kingdom, refinancing gains are shared with the government agency (OGC 2002). The Darent Valley Hospital PPP refinancing gain was reviewed by the National Audit Office in 2005. The franchisee of a NHS hospital asset had the investment re-valued 6 years after the contract was awarded. A new loan was arranged and the term extended by 14 years. The refinancing crystallised a capital gain of £33.4 million of which the public agency will receive around a third (£11.7 million) by way of lower annual contract payments and cash. From the public agency's perspective, the refinancing gave rise to immediate and deferred financial benefits. The franchisee achieves a strong return on equity and is well-positioned to sell the investment to a long-term institutional investor (NAO 2005)<sup>35</sup>. The Queensland government could potentially come to a similar arrangement for a sharing of the gains from revaluation and de-risking.

Another possible development might be for government thinking to evolve (perhaps with private sector assistance) to innovate in the pricing of risk into the structuring of transactions. For example, in a recent UK transaction, the public authority called for 3 option values to cap the excess value capture by the private sector over the base value/return.

The benefits of PPP's may also be non-financial. The positive externalities available from new infrastructure investment include public health and safety, improvements in the built environment to enhance public amenity, and quality of life (Aschaeur 1990). In the NAO review of the Wembley stadium project, public investment in the project was justified on the basis of the importance of the project to the overall regeneration of the Wembley area (NAO 2003c).

These are in addition to the many other benefits to the public, for example as outlined in Chapter 4.

## Acronyms

ASX	Australian Stock Exchange
ABS	Australian Bureau of Statistics
AusCID	Australian Council for Infrastructure Development
APRA	Australian Prudential Regulatory Authority
BCE	Business Council of Australia
CAGR	Compound Annual Growth Rate
CEDA	Committee for Economic Development of Australia
CGF	Capital Guarantee Fund
COAG	Council of Australian Governments
CSO	Community Service Obligation
DOT	Department of Transport
DSCR	Debt Service Coverage Ratio
EBITDA	Earnings Before Interest, Tax, Depreciation and Amortisation
GBE	Government Business Enterprise
GDP	Gross Domestic Product
GSP	Gross State Product
GST	Goods and Service Tax
IPA	Infrastructure Partnerships Australia
IPO	Initial Public Offering
IRR	Internal Rate of Return
NPV	Net Present Value
NWI	National Water Initiative
OECD	Organisation for Economic Coordination and Development
PFI	Private Finance Initiative
PPP	Public Private Partnership
PSC	Public Sector Comparator
ROA	Return on Assets
SEQIPP	South East Queensland Infrastructure Plan and Program 2006–2026
VFM	Value for Money
YoY	Year on Year

## Appendix 1 – Intent & acknowledgements

This paper has been prepared by the Wilson HTM Investment Group. It forms a chapter in CEDA's Sustainable Queensland series and has been prepared specifically for that purpose.

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The release of the South East Queensland Infrastructure Plan and Program 2006–2026 (SEQIPP) has created significant interest in the funding of Queensland's future infrastructure needs. These infrastructure needs are substantial, given the rapid rate of growth in the State and as outlined by the Plan. The role of the private sector in delivering infrastructure is potentially significant. As requested, the paper addresses whether there will be a sufficient supply of private capital available; and if so, whether Queensland will be able to marshal enough for its needs.

In order to provide an informed framework and so to suggest an answer to these issues, we have examined the costs and benefits of private sector participation in infrastructure projects around the world. We have drawn on experience within our firm, as well as on external sources and a variety of government, business and academic studies. However, we have not been asked to advocate or form a view on whether "more" or "less", of either "private" or "public" funding is "good" or "bad" for Queensland.

In the course of preparing this paper, Wilson HTM has drawn on the assistance of a number of external contributors and the Group would like formally to acknowledge their assistance.

The Group would particularly like to recognise the substantial research contribution of Jason Watters.

### DR MICHAEL REGAN

The Group wishes to acknowledge the assistance of Dr. Michael Regan from the Mirvac School of Sustainable Development at Bond University with research and preparation of this report.

### DR RICHARD COPP

The Group wishes to acknowledge the assistance of Dr Richard Copp. Richard is an economic advisor and a practising lawyer specialising in economic, corporate and commercial matters, including trade practices. He has worked on major projects with the Queensland Competition Authority, the Australian Competition and Consumer Commission, the Australian Tax Office, the Queensland Department of Minerals and Energy, Queensland Treasury, and the Commonwealth Bank of Australia.

## Appendix 2: Impediments to the formation of PPP's

The following is a brief summary of factors identified by the Department of Transportation in its Report to Congress on Public-Private Partnerships, December 2004.

All large-scale [infrastructure] investments face financial, technical, and political barriers, however several additional challenges must be overcome to implement a public-private partnership project.

Since PPPs are not the usual way of developing, funding, or even operating [infrastructure assets] the use of these partnerships often encounters obstacles including legal, financial, political, and cultural hurdles despite the benefits that such partnerships may bring to a project.

The major impediments to the formation of public-private partnerships, which include state laws and policies, local opposition, private sector concerns, and, funding and financing concerns.

### A. State laws and policies

State laws and policies are important factors to the ease or difficulty of forming public-private partnerships. Impediments that must be overcome at the state level include centralized procurement, design-build laws and regulations (or lack thereof), state enabling laws, and political leadership.

### B. Local opposition

This can be a critical indicator for certain types of asset. Generally, the public resists toll projects and opposes the tolling of pre-existing tax-supported roads. The public views the roads as "free" and believes that the construction and maintenance of these roads has already been paid for through federal and state gas taxes, as well as other fees. Tolls are often viewed as an additional charge for a road for which the public believes it has already paid through taxes and other fees. However, when roads must be expanded to handle peak travel demands, existing taxes paid by motorists are inadequate to cover the costs. Completed toll projects also demonstrate the importance of local community support.

### C. Private-sector concerns

Private-sector concerns also will affect the ability to form public-private partnerships. Uncertainty at many levels is a major factor in discouraging private investment in transportation facilities. Private-sector impediments include financing, land acquisition, environmental expertise, tort liability, and contractor concerns.

DOT goes on to examine difficulties arising from federal funding and financing requirements.

*Despite notable successes in such projects as the Alameda Corridor and the groundbreaking of SR 125S near San Diego . . . public-private partnerships (PPPs) are still viewed by many in transportation as unique and fraught with legal, financial, and administrative hurdles. Abundant experience in the use of PPPs in other areas, and the growing experience in transportation illustrate that these hurdles can be overcome. (Federal Highway Administration Administrator, Mary Peters)*

## Wilson HTM appendix 3: Infrastructure Investment in Australia

### Summary

Historically infrastructure provision has been the responsibility of state governments. Funding has been shared between state and commonwealth under a variety of policy regimes.

Since the 1980's state government expenditure across all states has declined as a % of gross product. This has also been a feature internationally, driven by the adoption of tighter fiscal and budgetary policies. In Australia, this shortfall does not appear to have been taken up by the Commonwealth. Rather, the reducing trend has coincided with micro economic reforms such as privatisation.

Rigorous analysis of infrastructure spend at the national and especially state level is hampered by data quality. Nevertheless there is general consensus amongst leading research and policy groups that greater levels of investment in infrastructure will be required going forward across the nation.

Queensland, as the fastest growing state in the nation for at least the last decade, is not exempt from that requirement. But there is no compelling evidence to suggest that Queensland has been any better or worse than its peers in terms of the public funds it has allocated to infrastructure spend.

### A1. Historical Infrastructure Investment

Responsibility for the provision of infrastructure lies largely with the States, but the Commonwealth raises most of the revenue through taxes. The states therefore require a significant transfer of funds in order to finance their budget needs, investing in infrastructure being one of them. The main sources of funding to the states include GST revenue, Specific Purpose Payments and other payments.

Microeconomic reform of the 1990s, via National Competition Policy, provided the catalyst for the deconstruction of the nation's natural monopolies – i.e., publicly owned, vertically integrated utilities – utilising third party access regulation as a means of satisfying the interests of investors in essential services and those who consume them. What followed was the privatisation of a number of key Commonwealth and State utilities across the energy, telecommunications and airport sectors. The

implementation of this reform agenda provided considerable benefits in terms of efficiencies and the de-risking of public balance sheets, at the expense of limited control over future investment in infrastructure.<sup>36</sup>

Since then, private sector participation has increased again through the use of public private partnerships (PPPs) as a delivery mechanism for infrastructure. Nonetheless, the model of government planned, installed and financed infrastructure with pricing at marginal cost or on a loss-making basis – with returns recovered through the taxation system – continues to characterise much of Australia's publicly provided infrastructure<sup>37</sup>.

### A2 Public Sector Funding Models

The main methods of funding infrastructure available to governments (as noted in Allen Consulting Group, 2003) are as follows:

- Government debt – this is the traditional funding source of governments to fund long-dated public infrastructure assets. Instruments include long-term debt such as bonds;
- Taxes – At the state levels, taxes include payroll tax, stamp duties and land tax. Municipal rates on residential, commercial and industrial property are also considered to be a tax at the local government level. Federal taxes include company and income tax which is used to fund programs such as Auslink and other specific purpose infrastructure grants as provided to the states;
- User Charges – these can include fares and tolls or tariffs, with charges normally linked to the cost of service provision. They differ from taxes because users can reduce their costs by reducing their use. Another user charge is congestion tax applied to reduce city traffic volumes;
- Producer levies – these are charges that are applied to the suppliers of public infrastructure services. Developer contributions are an example of this approach in use across Australia; and
- Special Purpose Vehicles – these relate to separate legal entities that are established to invest in infrastructure assets, operate them and to recover a return to repay the investment from users. A key characteristic is that they are 'off-budget', i.e. their revenues and expenditures are not recorded within general government accounts. Assets may be government or privately owned or a mixture of both, and also includes private investments that are supported by incentives or purchasing / servicing agreements with the public sector to provide public benefits.

Determining the most appropriate source of funding is complex. Optimal funding solutions should be targeted and structured so as to achieve economic growth, sustainability and international competitiveness for state and national economies.

### A3 Linkages between economic performance and the provision of infrastructure

The aim of Australian governments (both state and federal) is to ensure, through public and private investment, that an optimal level of investment is being achieved<sup>38</sup> – i.e. optimal for economic and productivity growth, international competitiveness and for the nation’s sustainability. In the late 1980s, coincident with the period of heightened micro-economic reforms, researchers began to take a greater interest in the specific relationship between public infrastructure investment and economic growth. There is extensive literature on the subject with most of the recent research focusing on the drivers of economic growth<sup>39</sup>.

The evidence, from the literature, suggests that there is a correlation between investment in infrastructure, output and growth. What is also clear is that the relationship is far from a linear one, the causal relationship is complex and flows in both directions and there are a large number of variables that operate to influence this relationship. As with the other principal drivers of growth in developed economies, namely investment in human capital and technology, improved productivity performance is the missing link and for any economy the ultimate policy objective.

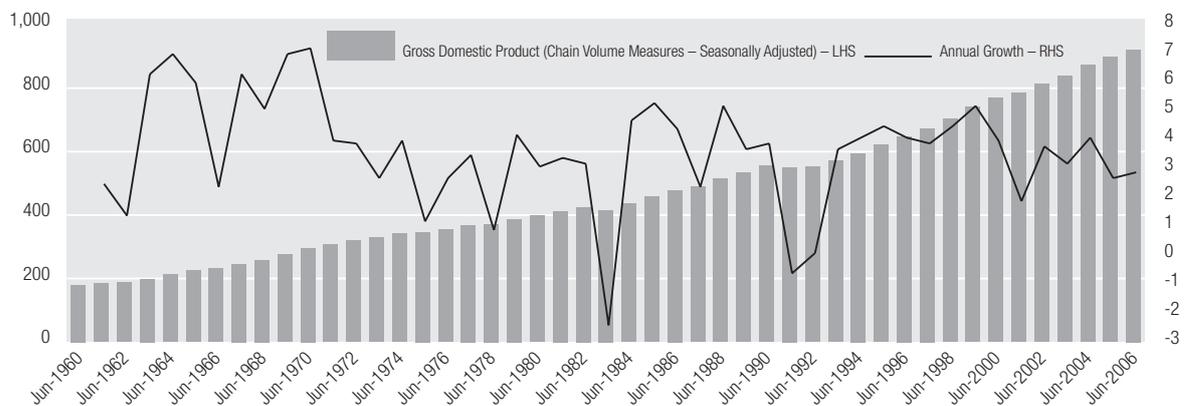
In this respect, the research points to a significant relationship and causation that runs from investment in infrastructure to economic growth directly, and via multi-factor productivity. However, the strength of the relationship varies between industries with investment in land transport and telecommunications generating the highest medium-term benefits<sup>40</sup> and investment in health and education generating the higher long-term benefits to the Queensland economy (Regan 2007).

In addition, the evidence also suggests that the effectiveness and level of public infrastructure spending is influenced by a number of factors including economic and physical geography, industry structure and the level of industrialisation<sup>41</sup>. That said, it is paramount for a nation’s economy (whether at a national or state level) that investment in infrastructure be maintained and planned to deliver the necessary benefits of essential public services whilst achieving the outcomes of economic growth, sustainability and international competitiveness. The following discussion examines economic growth patterns and corresponding infrastructure investment patterns at both the national and state levels.

### A4 Historical Economic Growth – National

The following figure shows Gross Domestic Product (GDP) (levels and YoY growth) for the period 1960–2006 (Chart 5). Growth in GDP was quite volatile up until the effects of microeconomic reform started<sup>42</sup> to take hold in the 1990s. Negative economic growth occurred in 1984, largely

**CHART 5: COMMONWEALTH GDP (LEVELS AND % ANNUAL CHANGE CVM)**



Source: ABS Cat No. 5206.0

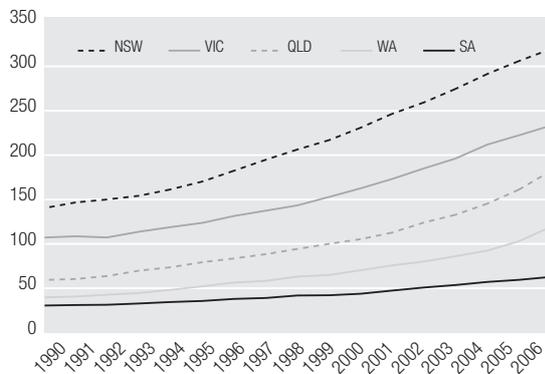
attributable to loose fiscal and monetary policy as well as the impact of the currency being floated. This occurred again in 1992, with the economy entering a recession following a number of years of unsustainable economic growth.

More recently, tighter fiscal and monetary policies have been coincident with lesser levels of volatility. On an absolute basis, GDP has increased significantly since 1992 as the economy came out of recession.

## A5 Historical Economic Growth – States

Queensland (as shown in Chart 6 and Chart 7) has been the fastest growing state economy in terms of GSP %. The State GSP Compound Annual Growth Rate (CAGR) over the last 10 years for Queensland was c.8.4 per cent compared to Western Australia 8.3 per cent, and NSW and 5.6 per cent and Victoria at c.6.1 per cent.<sup>43</sup>

**CHART 6: STATE GROSS STATE PRODUCT (GSP) (LEVELS) CURRENT**



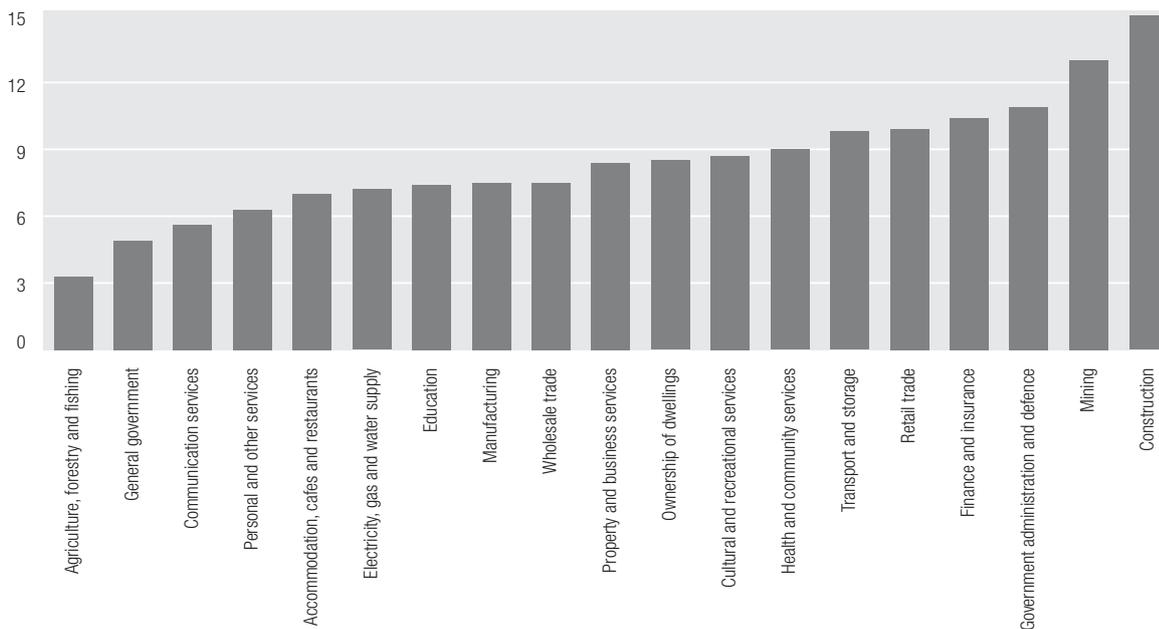
Source: ABS Cat No. 5220.0

**CHART 7: STATE GSP – 10 YEAR CAGR TO 2006 (NOMINAL, %)**



Source: ABS Cat No. 5220.0

**CHART 8: QLD INDUSTRIES TOTAL FACTOR INCOME 2001 – 2005**



Source: ABS Cat No. 5220.0

In the last year and a half Western Australia has outgrown Queensland in terms of GDP growth, driven predominantly by the recent minerals boom<sup>44</sup>. However over a ten year period Queensland has been much stronger. New South Wales and Victoria are beginning to slow with South Australia showing signs of steadying after years of high volatility.

## A6 Queensland Industry profile – Contribution to Economic Growth

In considering the remarkable growth of the Queensland economy is interesting to consider the industry sectors which have contributed the most to this growth. The contribution of the respective Queensland Industries to the State's economy is shown in Chart 8.

### A6.1 Queensland's Population Growth

Queensland has been the fastest growing State in terms of population growth since 1990. In the last year, Western Australia has out-grown Queensland as both skilled and unskilled workers have migrated to the west in search of employment opportunities and/or higher wages. Refer Chart 9 and Chart 10.

## A7 Infrastructure Investment Patterns – Public and Private Sector Participation

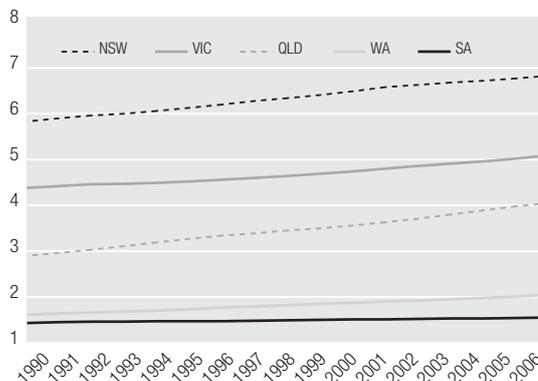
There are various sources of data on this subject, the comparability of which can present difficulty. Nevertheless, the biggest trends are highlighted by most of these data sets, and it is these which concern us here.

Most broadly, there has been a long term trend away from the public provision of infrastructure to private provision and this is shown in Chart 11. Research suggests this is part of a global trend. Public Infrastructure investment by State and federal governments, as a percentage of GDP, has been declining across all developed economies<sup>45</sup>.

Grimsey & Lewis (2004)<sup>46</sup>, highlight the key issues at play as:

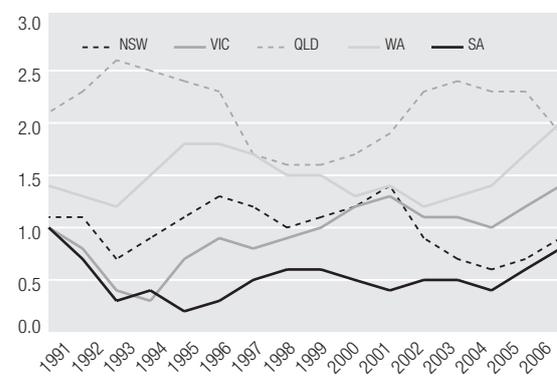
- The desire to reduce the impact of infrastructure spending on government budgets, whilst protecting economically necessary infrastructure investments; and
- Governments are turning to private capital markets for infrastructure funding. Coincident with that shift there has been a perception that a move from 'taxpayer pays' to 'user pays' (i.e. from ability-to-pay to benefit principle<sup>47</sup>) in the provision of infrastructure service (water, power) is likely to be associated with a better economic use of the services. Thus, it is reasonable to assume that "infrastructure" itself is becoming more commercially orientated.

CHART 9: STATE POPULATION (LEVELS) ESTIMATED ORIGINAL



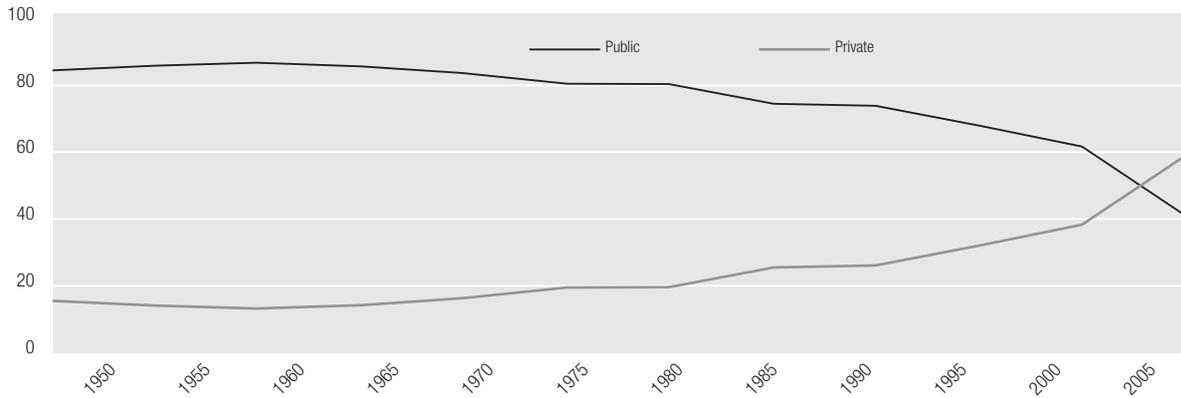
Source: ABS Cat No. 3101.0

CHART 10: STATE POPULATION (% CHANGE) ESTIMATED ORIGINAL



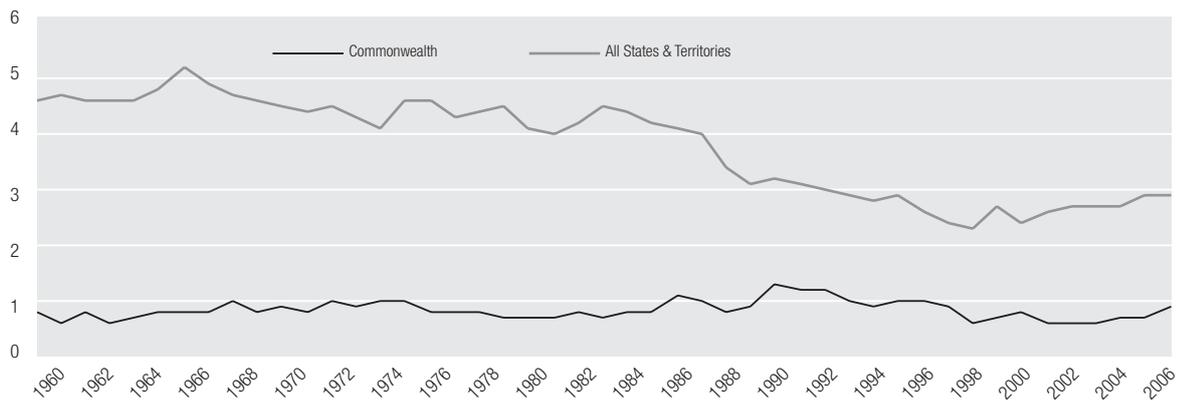
Source: ABS Cat No. 3101.0

**CHART 11: PUBLIC & PRIVATE % OF TOTAL INFRASTRUCTURE SPEND (CURRENT)**



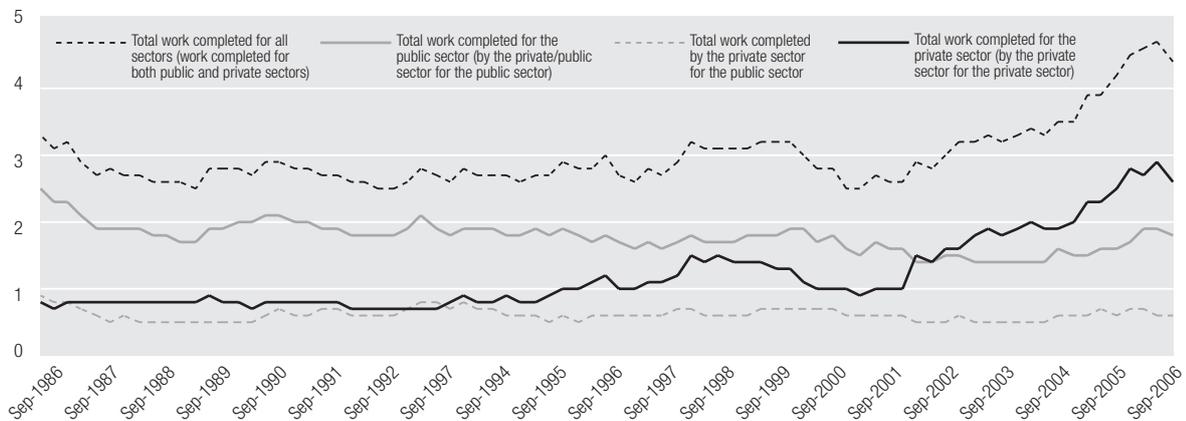
Source: ABS Cat No. 5206.0, 5204.0, 8762.0, Reserve Bank Occasional Paper 8, Regan 2007

**CHART 12: PUBLIC GFCF BY GOVT SECTOR AS A % OF GDP (CVM)**



Source: ABS Cat No. 5206.0, 5204.0, 8762.0, Reserve Bank Occasional Paper 8, Regan 2007

**CHART 13: VOLUME OF ECONOMIC INFRASTRUCTURE WORK COMPLETED BY SECTOR THAT WILL OWN/OPERATE COMPLETED PROJECT AS A PERCENTAGE OF GDP**



Source: ABS Catalogue 8762.0 Table 1, Wilson HTM

Chart 13 disaggregates overall (i.e. Commonwealth plus States) public sector spending on economic infrastructure.

The decline has been largely driven by the States.. Commonwealth spend ( as measured by Gross Fixed Capital Formation – ‘GFCF’ as a proportion of GDP )<sup>48</sup> has remained roughly flat. However state governments have reduced spending to approximately 2.8 per cent of GDP or 60 percent of 1984 levels.<sup>49</sup>

Work completed for the public and private sectors Australia-wide is presented in Chart 13. It draws on Engineering Construction data<sup>50</sup> to reveal that public sector spend has been in decline for quite some time; although there has been a recent increase in private sector spend, which is mainly attributable to the PPP phenomenon involving large scale complex infrastructure projects.

It is difficult to mount the argument that the increase in private sector spend compensates for the decline in work completed for the public sector as the private sector may have completed work that is not specifically an essential public service – i.e. public infrastructure. However, the results do show that work completed for the private sector by the private sector has increased significantly.

We note this degree of detail is not available at the state level; however in Victoria, private sector investment as a proportion of total infrastructure spending has averaged c.12 per cent; and in New South Wales the Government intends to allocate 10 – 15 per cent of it’s A\$110.0bn projected spend on its State Infrastructure Plan to the private sector or PPP procurement<sup>51</sup>, (over the next 10 years).

By way of comparison, the UK Government has indicated it will use private sector financing (under the PFI) *where it represents value for money to do so*, at an expected level of between 10 per cent to 15 per cent of public sector net investment<sup>52</sup>. Germany is intending to increase private sector participation from current levels of 4 per cent to 15 per cent.

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- 12 There is substantial overlap between managed funds and superannuation funds. To the extent that superannuation investors place funds for investment with professional funds managers, superannuation funds form part of the managed funds pool. However, substantial amounts of superannuation funds (such as ‘do-it-yourself’ funds of smaller superannuation fund investors and superannuation funds not outsourced to professional managers) do not form part of the managed funds pool. On the other hand, substantial managed funds are non-superannuation funds.
- 13 Source: Source: ABS Catalogue 5655.0
- 14 Source: Source: ABS Catalogue 5655.0
- 15 “Emperor’s New Shoes?” September 2006; Project Finance Magazine.
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- 25 It is widely assumed in the literature that PPPs are closed contracts where inefficiencies are limited to asymmetric information and moral hazard. PPPs are clearly incomplete contracts. The variables that can affect these contracts include: 1). Embedded options, 2). Output price regulation, 3). Unanticipated future capital investment; 4). Investment dynamics; 5). Agency considerations; 6). The existence of performance incentive and penalty provisions; and 7). Changes in the economics of “whole of life” asset maintenance regimes (Regan 2006).
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- 33 PSC evaluation provides a cost benefit analysis of Public Sector procurement against the next best competing alternative i.e. private sector provision
- 34 The article in the Australian Financial Review, 4 October 2006, PPP tip for \$3bn (A\$2.5bn) airport link noted that Babcock and Brown had initially teamed up with French Company Bouygues however this has been supplanted by information per Dow Jones International News article Australia’s Queensland Transport Projects Attract 4 Groups, 12 April 2007, (c) 2007 Dow Jones & Company, Inc.
- 35 This was the third audit of this project. The first was a National Audit Office review in 1998–99 and the second by the Parliamentary Accounts Committee in 1999 (NAO 1999; PAC 2000).
- 36 Investment in an asset too early has net present value implications –undesirable under a public-private risk sharing arrangement. Previous public sector infrastructure provisioning ensured sufficient supply to limit any demand-supply capacity imbalances.
- 37 CEDA, 2005, p8
- 38 Allen Consulting Group, May 2005, p12
- 39 There are over 200 articles, research papers, reports and books published about this relationship over the past 20 years.
- 40 The return from investment is not uniform and varies between regions and economies. Infrastructure investment per se is not necessarily the most effective tool for lifting economic development in ailing regional economies (Fox and Smith 1990).
- 41 These include institutional frameworks such as a sound financial system, property rights and the rule of law, human capital and the take-up of technology and innovation and policy frameworks that provide macro-economic stability, fiscal certainty and governance standards (Barro and Sala-i-Martin 2001; Eicher and Garcia-Penalosa 2006)
- 42 The policy of microeconomic reform was progressed by The Council of Australian Governments (COAG) in its National Competition Policy (NCP) of April 1995.
- 43 Source: ABS 5220
- 44 Interestingly the key drivers behind the recent minerals boom in Western Australia has been .....
- 45 Mehrotra, A. Valila, T. 2006, Public Investment in Europe: Evolution and Determinants in Perspective, Fiscal Studies, vol.27, no.4, pp.443–471.
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- 47 The ability to pay principle is that taxes or charges for public services should be levied according to the user’s capacity to pay, whereas the benefit principle holds that individuals should pay taxes or charges in line with the benefits each would receive from the services, akin transactions in the marketplace (see Musgrave, 1959).
- 48 The use of Gross Fixed Capital Formation (GFCF) from the National Accounts has generally been the favored statistic in the policy debate but this measure has a number of drawbacks primarily related to the fact that it does not reveal the market nature of infrastructure provision (such as outsourcing and public-private partnerships) and it is also difficult to get meaningful disaggregation at a sectoral level. In focusing on the creation of new assets, it does not include maintenance expenditures AusCID 2006.

The impact of the recession in the early 1990s likely represents the point in time where levels became unsustainable..

49 Engineering Construction Activity data provides additional insights to current infrastructure expenditure (but not the value of the stock of infrastructure assets). It provides a greater level of disaggregation (although this is still inadequate) and throws some light on the commercial relationships underpinning infrastructure provision by identifying those activities undertaken by the private sector for public sector infrastructure providers. However it too has its drawbacks. For example it does not include building construction which at certain times can be significant for some infrastructure sectors (such as airports), it classifies data on the basis of physical rather than economic characteristics (runways are classified with roads) and does not provide a segregation of expenditure on the basis of the level of government, rather it provides a geographical split on the basis of the location of the expenditure. Given these shortcomings it is only possible to paint a broad picture of the infrastructure investment trends in this country. Perhaps a re-engineering of ABS data, as suggested by IPA, may facilitate a more accurate and comparable assessment of these patterns. AusCID 2006.

50 2006; State Infrastructure Strategy, New South Wales 2006–07 to 2015–16; New South Wales Treasury, p4.

51 2006; State Infrastructure Strategy, New South Wales 2006-07 to 2015-16; New South Wales Treasury, p4.

52 Abadie, R., Head of PFI Policy at HM Treasury in S&P PPP Credit Survey 2006, p6.

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