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Productivity Commission

Public Infrastructure

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The Productivity Commission

The Productivity Commission is the Australian Government's independent research and advisory body on a range of economic, social and environmental issues affecting the welfare of Australians. Its role, expressed most simply, is to help governments make better policies, in the long term interest of the Australian community.

The Commission's independence is underpinned by an Act of Parliament. Its processes and outputs are open to public scrutiny and are driven by concern for the wellbeing of the community as a whole.

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27 May 2014

The Hon Joe Hockey MP
Treasurer
Parliament House
CANBERRA ACT 2600

Dear Treasurer

In accordance with Section 11 of the *Productivity Commission Act 1998*, we have pleasure in submitting to you the Commission's final report into Public Infrastructure.

Yours sincerely

Peter Harris AO	Dr Warren Mundy	Paul Lindwall
Presiding Commissioner	Commissioner	Associate Commissioner

Terms of reference

Public Infrastructure: Provision, Funding, Financing and Costs

I, Joseph Benedict Hockey, Treasurer, pursuant to Parts 2 and 3 of the *Productivity Commission Act 1998*, hereby request that the Productivity Commission (Commission) undertake an inquiry into ways to encourage private financing and funding for major infrastructure projects, including issues relating to the high cost and the long lead times associated with these projects.

Through this inquiry, the Commission is to conduct a broad ranging investigation into costs, competitiveness and productivity in the provision of nationally significant economic infrastructure and examine ways to: reduce infrastructure construction costs; address any barriers to private sector financing, including assessing the role and efficacy of alternative infrastructure funding and financing mechanisms, and recommending mechanisms and operating principles that may be applied to overcome these barriers; and, without limiting the generality of this reference, outline options to reduce construction costs.

Background

Efficient public infrastructure plays a key role in a competitive and productive economy and the ongoing funding and financing of infrastructure development in Australia is therefore of critical importance.

The capacity of government to meet expectations for improved infrastructure services is always limited, and the use of financing options involving the private sector can reduce the call on government resources, allowing scarce public funds to be targeted in a more effective manner.

While alternative financing and funding models offer opportunities to reduce the immediate call on governments, it should be noted that the application of new models is not a panacea. Ultimately infrastructure can only be funded through taxation, borrowings or direct user charges. There are difficult trade-offs to consider given increasing demand and competing priorities.

Scope of the inquiry

In reporting on funding and financing and the scope for reducing costs for public infrastructure projects, the Commission is to analyse and develop findings on the following:

1. How infrastructure is currently funded and financed in Australia, including by the Commonwealth, the States and the private sector.

2. The rationale, role and objectives of alternative funding and financing mechanisms, including:

    a. the full range of costs and benefits of different models

    b. the issues and costs associated with the allocation of project risks, availability of finance, contracting arrangements and delivery models for construction projects

    c. the disincentives to private sector investment

    d. broad principles for the use of these funding and financing mechanisms

    e. the roles of the Australian Government, the States and Territories, Local Government and the Private Sector in the implementation of these mechanisms, and the relationship between each of the parties

    f. creation of revenue streams to attract private sector finance; for example, through user charging, availability payments etc.

3. Consider the financial risks to the Commonwealth posed by alternative funding and financing mechanisms, as well as their possible impact on the Budget and fiscal consolidation goals.

4. Examine the cost structure of major infrastructure projects in Australia, including where infrastructure project costs have increased considerably, compared with other countries.

5. Provide advice on ways to improve decision-making and implementation processes to facilitate a reduction in the cost of public infrastructure projects, including in relation to:

    a. measures to improve flexibility and reduce complexity, costs and time for all parties

b. access to the market for domestic and international constructors, including barriers to entry, and what effect this has on construction costs

c. 'greenfield' infrastructure projects.

6. Comment on other relevant policy measures, including any non-legislative approaches, which would help ensure effective delivery of infrastructure services over both the short and long term.

Process

In undertaking this inquiry, the Commission should take into account the work being led by the National Commission of Audit to examine the scope for efficiency and productivity improvements across all areas of Commonwealth expenditure.

The Commission is to undertake an appropriate public consultation process including holding hearings and inviting public submissions. It will consult with the State and Territory Governments in undertaking this inquiry.

The Commission should release a draft report in March 2014.

The final report should be provided within six months of the receipt of these terms of reference.

The Government will consider the Commission's recommendations, and the Government's response will be announced as soon as possible after the receipt of the Commission's final report.

J. B. HOCKEY
Treasurer

[Received 13 November 2013]

Contents

The Commission's report is in two volumes. **This volume 1 contains the overview, recommendations and findings, chapters 1 to 8 and volume 1 references.** Volume 2 contains chapters 9 to 16, appendices A to J and volume 2 references. Below is the table of contents for both volumes.

Volume 1

Volume 2

Acknowledgments

The Commission is grateful to everyone who has given freely of their time to discuss with it the very wide range of matters canvassed in the terms of reference, especially those appearing at the roundtable, hearings and providing written submissions.

The Commissioners would like to express their appreciation to the staff who worked on the inquiry, led by Ralph Lattimore and John Salerian and included Rick Baker, Melissa Edwards, Carole Gardner, Jared Greenville, Anthony Housego, Ellie Jepsen, Alex Maevsky, Ana Markulev, Ian Moran, Greg Murtough, Tom Nankivell, Bonnie Nguyen, Hudan Nuch, Chris Perks, Joshua Runciman, Carl Toohey, Elise Whalan and Kirsten Wren.

Abbreviations and explanations

Abbreviations

ABCC	Australian Building and Construction Commission
ABS	Australian Bureau of Statistics
ADI	Authorised Deposit-Taking Institutions
ALC	Australian Logistics Council
APAC	Australian Pacific Airports Corporation
APRA	Australian Prudential Regulation Authority
ARTC	Australian Rail Track Corporation
ATO	Australian Taxation Office
BIM	Building Information Modelling
BIT	Building Industry Taskforce
BITRE	Bureau of Infrastructure, Transport and Regional Economics
BOO	Build-Own-Operate
BOOT	Build-Own-Operate-Transfer
COAG	Council of Australian Governments
CRRP	COAG Road Reform Plan
CSO	Community Service Obligation
DBFM	Designs, Builds, Finances and Maintains
DBFO	Designs, Builds, Finances and Operates
EBA	Enterprise Bargaining Agreement
FWBC	Fair Work Building and Construction
GDP	Gross domestic product
GFC	Global Financial Crisis
GNSS	Global Navigation Satellite System
GTE	Government trading enterprise

HVCI	Heavy Vehicle Charging and Investment
IA	Infrastructure Australia
IAC	Industries Assistance Commission
IAP	Intelligent Access Program
IBTO	Infrastructure Borrowings Tax Offset
IC	Industry Commission
IDA	Infrastructure Debt Authority
IE	Independent Economics
IGA	Intergovernmental Agreement on Federal Financial Relations
IFWG	Infrastructure Finance Working Group
IPART	Independent Pricing and Regulatory Tribunal
IR	Industrial relations
IRR	Internal rate of return
LRMC	Long-run marginal cost
LTNZ	Land Transport New Zealand
MFP	Multifactor Productivity
MRA	Metropolitan Redevelopment Authority
NICS	National Infrastructure Construction Schedule
NPP	National Partnership Payment
NPV	Net present value
NTC	National Transport Commission
OECD	Organisation for Economic Co-operation and Development
PAYGO	Pay-as-you-go
PC	Productivity Commission
PFI	Private Finance Initiative
PPP	Public private partnership
PSC	Public Sector Comparator
RAB	Regulated Asset Base
RBA	Reserve Bank of Australia
RUC	Road user charge

SCOTI	Standing Council on Transport and Infrastructure
SDP	Sydney Desalination Plant
SPP	Specific Purpose Payment
SPV	special purpose vehicle
SRMC	Short-run marginal cost
TCA	Transport Certification Australia
TIF	Tax increment financing
TIFIA	Transportation Infrastructure Finance and Innovation Act (US)
TOR	Terms of reference
WHS	Work health and safety

Explanations

Billion	The convention used for a billion is a thousand million (10^9).
Findings	*Findings in the body of the report are paragraphs highlighted using italics, as this is.*
Recommendations	***Recommendations in the body of the report are highlighted using bold italics, as this is.***

OVERVIEW

Key points

- There is an urgent need to comprehensively overhaul processes for assessing and developing public infrastructure projects.
  - There are numerous examples of poor value for money arising from inadequate project selection, potentially costing Australia billions of dollars.
  - Additional spending under the status quo will simply increase the cost to users, taxpayers, the community generally, and lead to more wasteful infrastructure.
  - Reliance on the notion of an infrastructure deficit, too, could encourage poor investment choices.
- It is essential to reform governance and institutional arrangements for public infrastructure to promote better decision making in project selection, funding, financing and the delivery of services from new and existing infrastructure.
- Well-designed user charges should be used to the fullest extent that can be economically justified. However, governments will have to continue to fully or partly fund some infrastructure projects and address equity issues.
- Significant institutional and longer-term road pricing arrangements will create more direct links to road users, taking advantage of advances in vehicle technology.
- Private sector involvement in infrastructure provision and/or financing delivers efficiency gains only if well designed and well implemented.
  - Private financing is not a 'magic pudding' — ultimately users and/or taxpayers must foot the bill.
  - Government guarantees and tax concessions are not costless and often involve poorly understood risks.
- Governments will have some capacity to fund more projects than under current fiscal and debt management practices, provided the reform package in this report is implemented to ensure the selection of projects with strong net benefits.
- Data problems limit analysis and benchmarking. A coordinated and coherent data collection process will address this and improve future project selection decisions.
- Nevertheless, there is evidence of recent significant increases in the costs of constructing major public infrastructure in Australia. Elevated labour costs due to the mining construction boom has been one factor, but no single input has played a decisive role in cost increases.
- Until recently, labour productivity growth in the construction sector generally has been sluggish. There is no conclusive evidence that Australian levels of productivity in construction are significantly different from other developed countries.
- The industrial relations environment in the construction industry remains problematic, mainly in general rather than civil construction, with the problems much greater for some sites, unions and states. Governments can use their procurement policies to drive reform, and penalties for unlawful conduct should rise.
- Despite significant concentration in the market for large public infrastructure projects, the market appears to be workably competitive today, though a few simple measures would make it more so and would reduce the cost pressures facing procurers.
- There is significant scope to improve public sector procurement practices and lower bid costs for tenderers, with potentially large benefits for project costs and timing.

Overview

Efficient provision of infrastructure, including public infrastructure, is the hallmark of a well-functioning economy. Australian governments have traditionally taken overall responsibility for most aspects of public infrastructure provision. In part, this was due to a desire to ensure equitable access to services across the community and because there is a range of 'market failures' that would lead to inadequate provision if decisions were left entirely to the private sector. However, over recent decades with the maturing of private markets, there has been an increasing recognition of the benefits that can come from greater private sector involvement in the provision of public infrastructure.

There are several drivers of an increased interest in public infrastructure.

- Widely held views that deficiencies in certain aspects of Australia's infrastructure — such as in roads, rail, and ports — are holding back productivity growth and affecting the amenity of our cities and regional areas. This gives rise to concerns about an overall infrastructure deficit.
- Apprehension about the costs of delivering new public infrastructure and the potential for efficiency gains in the delivery and use of infrastructure, including those that might be induced by new opportunities for user charging.
- Concerns about debt and long-term budgetary pressures being faced by governments at all levels and how these might affect the provision of public infrastructure, for which there is often limits to funding through direct user charges.
- Macroeconomic objectives of offsetting decreasing investment and employment in other sectors and promoting economic growth more generally.

This focus on public infrastructure and how community expectations about its provision can be met is also an international phenomenon, as evidenced by interest from the G–20, the OECD, the World Bank and the International Monetary Fund.

What has the Commission been asked to do?

The Australian Government has asked the Productivity Commission to undertake a wide–ranging inquiry into public infrastructure that assesses:

- how infrastructure is currently funded and financed in Australia, including by the Australian Government, the States and Territories and the private sector
- the rationale, role and objectives of alternative funding and financing mechanisms
- financial risks to the Commonwealth posed by alternative funding and financing mechanisms, as well as their possible impact on the budget and fiscal consolidation goals
- cost structures of major projects in Australia, including where infrastructure project costs have increased considerably compared with other countries
- ways to improve decision making and implementation processes to facilitate a reduction in the costs of public infrastructure projects
- other relevant policy measures, including any non-legislative approaches, that would help ensure the effective delivery of infrastructure services over both the short and long term.

Government decision making about public infrastructure is complex because of the:

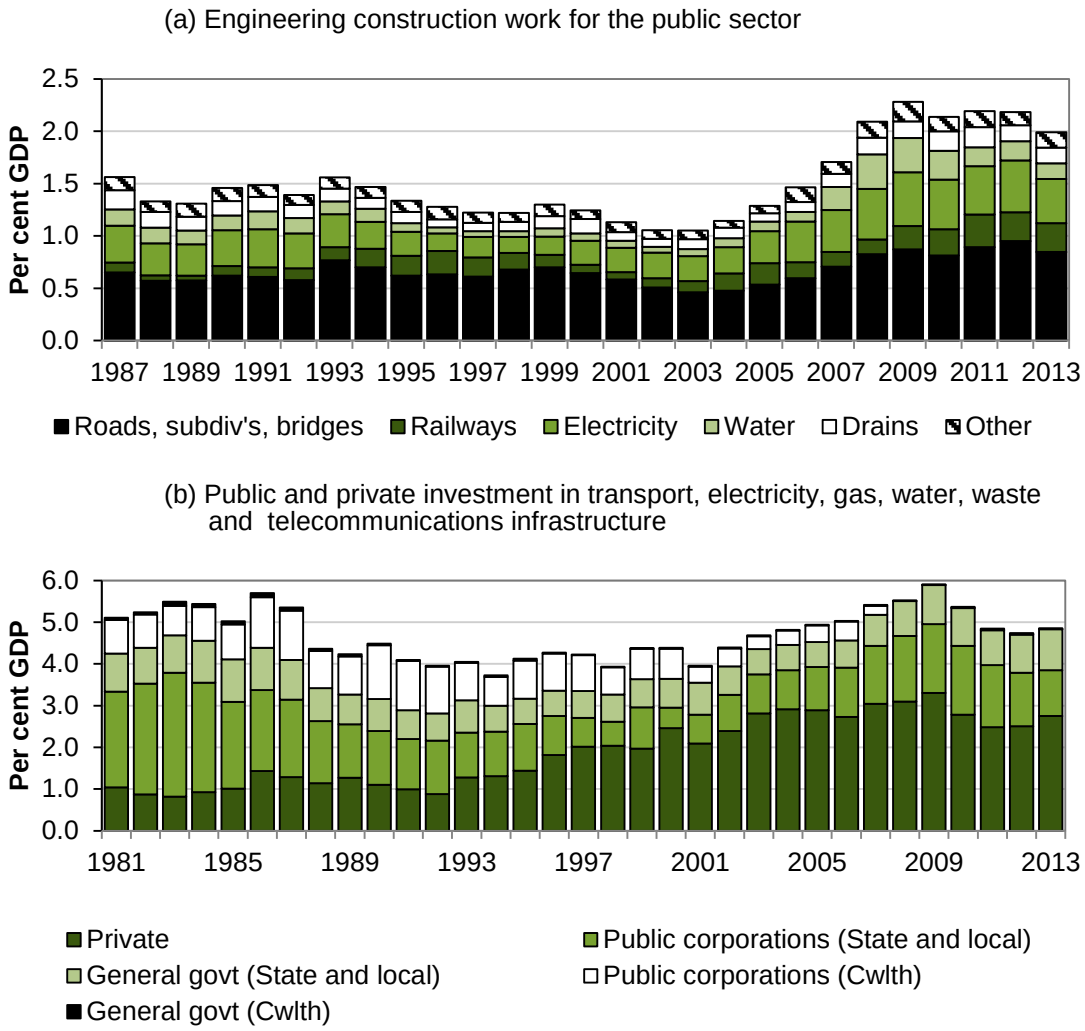
- need to address efficiency, productivity and social objectives
- presence of market failures, especially externalities and natural monopoly
- competing proposals and opportunities for political and financial gain or loss
- long-lived nature of the assets
- need to plan for provision well in advance, which can involve restricting other land uses for many years
- changes over time in industry structure, population size and distribution across and within regions that can be difficult to predict
- important technical and economic differences across the various types of infrastructure.

The terms ‘funding’ and ‘financing’ are often conflated. For the purposes of this inquiry, funding refers to the revenue-raising sources and streams to pay for the costs of infrastructure over its life (such as user charges). Financing refers to the supply of capital (private or public) used to pay for the upfront investment costs of an infrastructure project. The term public private partnership (PPP) is used broadly

in this inquiry to cover procurement models involving some privately financed investment.

Investment in public infrastructure is substantial. Engineering work done for the public sector has been equivalent to more than 2 per cent of GDP since 2008 (figure 1, panel a). Much of this has involved roads, bridges and electricity infrastructure. There has also been a significant amount of investment in buildings for the public sector, such as hospitals. However, over the past two decades, private sector investment has grown, and in recent years it has typically accounted for around half of total infrastructure investment (figure 1, panel b).

Figure 1 **Trends in infrastructure provision**



The provision and procurement of public infrastructure encompasses a complex and politically hazardous range of policy and administrative decisions. Decisions need

to be evaluated carefully to ensure that long-term net benefits are not undermined in the pursuit of short-term gains, including political ones.

In undertaking this inquiry, the Commission has sought to identify practical improvements based on:

- recognising the importance of transparent cost–benefit analysis and institutional and governance arrangements, which involves selecting projects and allocating risks to maximise the net benefits for the whole community
- considering the full range of options for government and private involvement, with a particular focus on funding and financing
- looking for ways to achieve cost savings in the delivery of projects.

There is scope to do much better

There are many examples of inadequate project selection that have led to costly outcomes for users and taxpayers. These include electricity networks and desalination plants in some states. An Australian Government example is the decision to proceed with the National Broadband Network without doing a thorough analysis of its costs and benefits.

Efficient infrastructure provides services that improve both productivity and quality of life. However, poorly chosen infrastructure projects can reduce productivity and financially burden the community for decades with infrastructure that is unnecessary and expensive to maintain. (A noteworthy international example is Spain's Ciudad Real airport, which was opened in 2008 at a cost of about €1 billion and closed in 2012 after only four years of operation.)

A key message of this report is that there is a fundamental need for a comprehensive overhaul of the poor processes currently used in the development and assessment of infrastructure investments particularly, but not exclusively, by governments. The costs of poor project selection and delivery will be exacerbated if governments decide to increase their infrastructure investment programs without reforming their governance regimes.

All other desirable or aspirational objectives — project pipelines, increased private financing, cost savings and even user charging and pricing reform — ultimately depend for their efficacy on having a much-strengthened and widely-applied set of credible and welfare-enhancing reforms.

Private financing of infrastructure projects, including through the use of PPPs, has grown over recent years, although the commercial failure of a number of toll roads and the global financial crisis led to a slowing of this trend (box 1). This slowing has also led to an increased scrutiny of, and focus on, various private financing mechanisms. The outcomes from PPP infrastructure projects have been mixed, which is consistent with that observed internationally.

Box 1 **Illustration of mixed outcomes from public private partnerships**

In some instances, governments have assumed risks associated with public infrastructure projects that have not performed well. For example, in 2002 the Victorian Government exercised 'step-in rights' under its contract with the private operators of the Latrobe Regional Hospital because of the substantial operating losses (stemming from a low initial bid price) and the inability of the private sector consortium to make the efficiency gains originally assumed. Similarly, the NSW Government incurred significant costs from the Sydney Airport Rail Link after the company that built and operated the link failed to meet scheduled payments to creditors.

In other cases, outcomes have been negative for private sector investors, but arguably positive from the point of view of some users, who got a new road. For example, when tolls were introduced on the CLEM7 motorway in Brisbane, patronage was about one third of the forecast. Within a year, the private party was put into receivership and the (then government-owned) Queensland Motorways eventually acquired the $3 billion project for $618 million. However, some participants have claimed that this and other investment losses, such as the Cross-City Tunnel in Sydney and the Airport Link motorway in Brisbane, have caused private investors to be less willing to take on patronage risk in subsequent projects. This may be a temporary phenomenon.

In contrast, there have been successful projects. For example, Melbourne's CityLink and Sydney's Eastern Distributor projects are generally considered to be successful public infrastructure projects from a public and private sector point of view, notwithstanding concerns about the level of concessions provided by the Victorian Government to Transurban for the Melbourne CityLink project.

In the case of privatisations, the Commission has commented previously on the success of the Australian Government's airport leasing program.

User charges are the norm in many public infrastructure sectors (including electricity, gas, telecommunications, water, ports, airports, and public transport). However, there has been a reluctance among policy makers to explore and actively pursue potentially innovative means of user charging in other areas, particularly for road transport (apart from a limited number of toll roads in Sydney, Melbourne and Brisbane).

There have also been increasing concerns about costs and productivity within infrastructure sectors. Many stakeholders have a perception that costs are high, especially in comparison to some of Australia's international peers. There have also been claims that costs have risen steeply in recent years, making infrastructure unnecessarily costly. The data supports some, but not all, of these perceptions.

Government-imposed deficiencies in design and pricing can thwart the potential for private sector involvement, particularly private financing. For example, the Queensland Government required one toll road operator to place toll points before and after entry and exit points for major interconnectors respectively. This provided almost half of the users with an opportunity to use a significant part of the road free of charge, increasing the burden imposed on taxpayers relative to users.

To sum up, governments are sometimes weak at determining what, where and when infrastructure projects should be scoped and constructed. This stems from deficiencies in using coherent decision-making frameworks to assess the portfolio of potential projects, especially:

- scoping and developing transparent cost–benefit analyses
- appropriate long-term planning for corridors, rigorous demand forecasting, investigating project risks fully (including latent risks borne by governments)
- providing opportunities for users rather than taxpayers to fund projects
- efficiently allocating risks between public and private partners.

There is substantial room for improvement, particularly in the decision-making processes of governments.

Role of governments and improving decision making

Building a credible and efficient governance and institutional framework for project selection is a critical and urgent task for governments. Processes aimed at improving the transparency and efficacy of decisions only work when Ministers and other elected officers fully support these institutional arrangements, especially when there are politically expedient alternatives.

Selecting the right projects is the most important aspect of achieving good outcomes for the community, irrespective of the funding and financing mechanisms used. It is at the stage before contract signing that governments have the best opportunity to ensure infrastructure meets the needs of the community efficiently and cost effectively.

Role of transparent cost–benefit analysis

Properly conducted cost–benefit studies of large projects, and their disclosure to the public, is an important starting point for guiding project selection and improving the transparency of decision making. The assessment should be augmented with a real options analysis where useful. Also important is awareness of matters that might be outside the scope of a project level cost–benefit analysis, such as equitable access to infrastructure (which can be addressed effectively through other policies, such as community service obligations).

The institutional and governance arrangements within which project proposals are analysed, compared and selected are also vital. Reforming these is important to avoid project selection biases and delivery problems. Although this will not guarantee the selection of good projects, it substantially reduces the probability and harm from poor project selection. Project selection problems are manifested in two directions — either selecting projects with negative net benefits or failing to select projects with high net benefits.

Role of risk analysis and allocation

The overarching motivation for involving the private sector in the delivery of public infrastructure services is to improve the economic efficiency in the delivery of services to the community (box 2).

Private sector involvement that does not have this as its principal objective is at a major risk of sub-optimal outcomes.

Additional efficiency gains may be achieved when private sector involvement includes private financing. These gains can arise from the greater commercial discipline and due diligence imposed by private financiers in the design, construction and operation of public infrastructure services.

In some cases, the private sector has replaced government and is making efficient decisions regarding project selection, such as those taken by many major and regional airports following their privatisation.

Private sector involvement also brings additional risks and costs, which need to be weighed against the benefits above. These include motivating the private sector participant(s) to act in the best interests of the community in the presence of asymmetric and incomplete information, and the transaction costs associated with negotiating and contracting with private parties.

Box 2 **Potential benefits of public private partnerships**

Only if well-designed and executed does a PPP agreement offer the potential for efficiency gains compared with traditional public procurement. Bundling together design, build, operate and financing may bring greater discipline and incentives to providers to reduce life-cycle costs for an infrastructure project. The potential benefits of using such procurement methods, including private financing, are that they can lead to a lower overall cost of providing infrastructure services. For example, they can facilitate:

- access to private technology and innovation, including specialised contractors and operators
- enhanced private sector incentives to deliver projects on time and within budget
- opportunities for competition for the market in provision of infrastructure and its services
- long-term value for money through credible risk transfer.

PPPs might also offer a valuable means of encouraging better use of pricing and other efficiency-enhancing mechanisms associated with infrastructure. Private financing can create options and incentives to overcome policy-makers' reluctance to adopt better practice.

In effect, involving the private sector through a partnership can unleash substantial gains. Yet there are also greater risks if: there is poor project selection; the more complex set of contracts with the private sector are inadequately written; or short-term considerations dominate judgments. A PPP project can go awry.

The best way to prevent this is by high-quality analysis of the project by pertinent experts employed by the government and by carefully designing the contracts so that risks are transferred efficiently, transparently and credibly, with incentives that align the interests of the private sector with that of the public.

In practice, there may be factors that detract from the effectiveness of risk allocation arrangements, including:

- incentives to shift risk to parties not best able to manage them, and a lack of clarity about the risks being allocated
- implicit or perceived government guarantees (which are never costless), which might create perverse incentives for risk management.

Overcoming these challenges is far from straightforward. There is no single approach to determine risk allocation, the well-founded level of private sector involvement, or the particular procurement model to deliver public infrastructure services. There are some risks (such as ensuring service continuity to the

community in the event of the insolvency of a private provider) that cannot be credibly transferred to the private sector. Governments should not only take care to avoid inadvertently paying the private sector for such risks, but also take active steps to ensure arrangements are put in place from the outset to deal with such an eventuality.

Sectoral and regional differences might mean that models of private sector involvement that best serve the community's interests in one sector or location may not be the most opportune in others. The choice of delivery model should be based on providing the best value for money to the community from delivering public infrastructure and services.

Funding

Public infrastructure funding must come from payments for the provision of services through market-based prices (determined by consumers and providers and possibly supervised by regulators), taxes on beneficiaries, general taxation sources, and occasionally from philanthropy.

User charging

User charges should be used to the fullest extent that they can be economically justified. Well-designed and efficient user charges are likely to be superior to taxpayer funding of infrastructure in many situations. Efficient user charges are an effective means to reveal willingness to pay for new infrastructure and to improve the use and augmentation of existing infrastructure.

User charges are already the norm for most types of economic infrastructure, such as electricity, telecommunications, gas, water and many transport sectors. Concerns about market power can lead to such charges being determined or monitored by a regulator. The extent to which user charges are able to recover the full costs of supply differs across sectors and regions. As infrastructure can provide benefits over generations, user charges too can span generations if they properly reflect the effective life of the assets concerned.

Roads

Although there are some toll roads in Sydney, Melbourne and Brisbane, the majority of roads are not subject to direct user charges. There is already a system of charges for heavy vehicles and some effort has been made to scope the linking of

charges to mass, location and distance travelled. Well-designed user charges for road use would provide an efficient long term and sustainable funding base to improve road provision to all Australians.

Governments should undertake pilot technical studies of (revenue-neutral) direct road user charging for cars and light vehicles using vehicle telematics and extend tolling across existing road networks as it becomes practical and cost-effective to do so. The application of charging mechanisms created by rapidly-changing communications technology appears promising. Importantly, these trials would introduce direct user charges as a substitute for other taxes, such as the fuel excise.

Governments should also actively encourage the exploration of new pricing approaches as technologies develop in other sectors (such as switch-off devices for electricity).

However, user charging is not a panacea to meeting all public infrastructure needs. There will continue to be a role for governments to fund, at least partly, some types of public infrastructure, including roads. This can be warranted: when it is impractical to exclude users who do not pay direct charges; where the transaction costs exceed the benefits of charging; or the wider beneficiaries are difficult to identify or are diffuse. In effect, there will be some roads that always remain a community service obligation.

That is why a mix of government funding and direct charging will remain appropriate for roads, public transport and social infrastructure.

Where needed, government funding should generally be sourced from broad–based taxes (income, consumption or land taxes) because they have lower efficiency costs. Income and consumption taxes, by far the largest in terms of the level of revenue raised, are levied by the Australian Government. This vertical fiscal imbalance means that the Australian Government has a vital role in funding infrastructure spending by State, Territory and Local Governments.

The Australian Government should use this role to:

- encourage direct user charging and value-capture measures (such as betterment levies and property development charges) where justified
- improve project selection and delivery
- promote collection of data and information to inform decision making by governments about future infrastructure projects.

The potential opportunities for new forms of user charging should be explored in conjunction with institutional models (and policy frameworks) needed to facilitate implementation and community acceptance of these new directions.

Infrastructure funds

Some participants have suggested the creation of various forms of infrastructure funds, including an infrastructure bank. The Commission cannot identify the evidence necessary to justify providing special support for infrastructure via a dedicated fund or bank. These models are likely to be suboptimal on the basis that they create additional risks, even should the governance arrangements be sound. The availability of pre-committed funding in this general way can create pressure to spend on projects that do not necessarily yield the highest net benefits to the community.

Financing

There are three broad mechanisms that can be used to involve the private sector in delivering infrastructure: traditional procurement using government financing; corporate financing; and project financing. The first (traditional procurement) uses government financing and the other two use private financing (and are classified as PPPs).

PPPs are not a magic pudding

As noted (box 2), PPPs can generate benefits. However, PPPs also appeal to governments for another reason. There is a perception that they offer a way to increase the provision of public infrastructure without drawing on a government's purse, thereby circumventing budgetary and borrowing constraints. This can only be so if the expectations for proposed projects are that over the life of the projects, revenues from direct user charges would be sufficient to recover the total costs of the project, including an appropriate risk-adjusted return on capital.

Otherwise, while PPPs offer scope to alter the timing of government payments to fund infrastructure services, they do not necessarily alter the long-run impacts on government budgets (setting aside the efficiency gains and any intergovernmental transfers arising from tax treatments of depreciation and interest expenses). If a PPP involves non-contingent obligations to make future payments to private sector providers, this creates a liability that needs to be funded from taxes and/or government charges, and has an effect analogous to direct government borrowing.

Some forms of availability payments have been developed for road projects that are of this kind. Ultimately, ratings agencies see all claims on a government as the same. There is no magic pudding.

A common public perception is that increasing government debt levels are synonymous with financial imprudence and inherently undesirable. This has been particularly the case since the global financial crisis, and such concerns are well founded for a number of countries, especially in Europe. However, when governments are considering whether or not to borrow, it is important to consider both the purpose for borrowing and the existing level of indebtedness.

In Australia's case, governments that implement the suite of recommendations in this report will, other things being equal, improve their capacity to fund higher levels of public infrastructure provision. Projects of demonstrable high net social benefit but of lesser commercial value to the private sector (less amenable to user charging) may be a particular target for such investment. However, proper assessment of projects and efficient delivery is crucial in these circumstances.

Potential benefits from greater use of user charges

PPPs might assist in providing an alternative where governments impose restrictions on public infrastructure capital expenditure, regardless of project benefit. Where this occurs, the community may well be worse off. In this situation, to the extent that user charges can be used to fund the return on investment, private sector provision offers a way to increase the delivery of infrastructure and raise community welfare.

Potential costs of PPPs

The benefits of using PPPs need to be offset against the higher costs relating to relatively more complex development bidding and contracting to ensure that risks are credibly borne by those best able to control them.

The opportunity cost of capital for governments is a contentious topic. Some commentators and participants argued that governments should use the long-term bond rate as the cost of capital comparator. However, this would be problematic because some risks associated with projects being funded by governments are usually allocated to taxpayers and the cost of capital should reflect this.

Therefore, the assessment of a project should be a function of the project's cash flows, not the legal character of the agent providing finance. That is, the long-term

government bond rate, often used as a surrogate for the risk-free rate of return, is *not* an appropriate benchmark for comparisons with the risk-adjusted return of public infrastructure projects precisely because these projects are not risk-free. Consequently, PPPs can be expected to require rates of return that are higher than the government bond rate and commensurate with the higher risks of the project.

In principle, PPPs might be delivered as concessions where the revenues to the provider are derived solely from end-user charges. Such projects are not on the government's balance sheet, apart from notes about the contingent liability risks associated with the contract (which should be immaterial for a well-designed PPP contract).

However, PPPs with private sector finance do appear on a government's balance sheet to the extent that there are non-contingent, long-term contractual payments provided by the government for the delivery of services (for example, availability payments, which are finance leases on the government's balance sheet). In such circumstances, there are fiscal effects and there is no free lunch provided by the private sector.

Private financing issues

The finance matters raised by many participants focused on ways by which the uncommercial component of public infrastructure investment, including risk, can be assigned to governments.

Uncommercial infrastructure projects

Many participants argued that the commercial failure of some high-profile PPPs, combined with the global financial crisis, has meant that it is presently uncommercial to allocate certain risks to the private sector (particularly demand risk for greenfields public infrastructure). The views of participants imply that there is often a gap between a government's assessment of the value of a public infrastructure project to the community and its commercial value to private providers (based on revenue streams possible from direct user charges). Many of the suggestions that inquiry participants made about funding and financing instruments were designed to get governments to fund or finance the 'gap'.

However, like all cyclical oscillations between exuberance and risk aversion, this attitude might be shifting as the more recent example of private failure becomes more remote.

The finance community has generally indicated that it is only too willing to provide and finance public infrastructure projects where it has assessed the projects to be commercially viable.

Procurement processes and the cost of finance

Some participants argued that the current process of requiring fully financed bids (where debt and equity providers are committed to each bidding consortium before the preferred bidder is identified) imposes relatively higher costs for consortia preferring a greater proportion of equity and discourages longer-term bond finance options. There could be benefits in creating greater competition from a wider portfolio of finance sources in some situations. In addition, a greater range of financial instruments of varying structure and tenor could allow for a more efficient allocation of financial risks.

Relaxing the fully financed bid requirement

The Commission proposes that governments' pilot bidding processes in which the requirement for bids to be fully financed at the time of tendering is relaxed. The preferred bidder (normally providing equity to the project) would subsequently determine the finance structure and arrange the necessary debt prior to financial close on the project. This could encourage greater interest in greenfield PPPs by consortia with longer-term investors, such as superannuation funds and issuers of long-term bonds.

Governments would need to trade off the potential cost savings and competitiveness benefits against the costs of greater due diligence regarding bankability at the initial bidding stage, and risk of higher transaction costs if a preferred bidder subsequently fails to secure debt finance. The higher transactions costs could be borne by the bidder through forfeiture of a bond in the event that finance cannot be raised.

Inverted bid

Some representatives of the superannuation sector are promoting an alternative bidding process referred to as the 'inverted bid' model to address the procurement issues raised above. While the proposal is still being developed, the Commission has some reservations about the framework relating to probity, competition in procurement and clarity of risk sharing between governments and private providers.

The Commission considers that a hybrid model based on the existing bidding framework and elements of the inverted bid could be worth trialling. The key elements of the hybrid model include:

- the conduct of rigorous cost–benefit analysis of the project that is transparent and available to all bidders, in accordance with the reforms set out in this report
- the key selection criteria for winning bids would be the lowest *expected* internal rate of return on *unlevered* equity, which is then used to lock in the revenue arrangements (including tolls and/or availability payments) over the life of the project. This ensures that the providers bear the risks allocated to them over the life of the project
- a secondary debt financing competition by the preferred bidder (a relaxation of the requirement for fully financed bids).

Corporate bond market

A number of participants to this inquiry raised concerns about the shallow depth of the Australian corporate bond market. They also argued that this was having an adverse impact on the financing of PPPs by private providers. However, many Australian infrastructure companies (particularly airports and electricity businesses) have been for some time active borrowers offshore. For example, Aquasure (the Victorian desalination plant special purpose vehicle) recently issued about US$400 million of bonds in the US private placement market (with about one-quarter of that being in Australian dollar denominated securities). A significantly lesser amount was raised in the Australian bond market, for the same refinancing.

This policy issue has not been examined in depth in this inquiry because of time constraints and its narrower scope. The participants to this inquiry have also raised the issue in the current Financial System Inquiry, which is due to provide its final report to the Australian Government in November 2014. The Commission urges that inquiry to give full consideration to this matter.

Capital recycling

Many participants to this inquiry strongly supported capital recycling — the hypothecation of the proceeds of privatisation to the procurement of new infrastructure. Recycling may be a useful program to build community support for efficient privatisation and the use of taxpayer resources to fund and finance new infrastructure.

But, critically, it could act to encourage privatisation in circumstances that are not fully justified and encourage the selection of new projects that do not have demonstrable net benefits. Already, examples of promises to reinvest have emerged in regions where assets are being sold. Tying funds to particular regions is no assurance that the highest net benefit investments are being considered.

Governments have successfully privatised airports, major ports and electricity infrastructure and services. The Commission is recommending that states proceed with the sale of any remaining assets of these types, subject to good sale processes including a sound regulatory framework. The priority for the sale of government-owned assets is not to secure the highest price *per se*, but to ensure that:

- economic efficiency is achieved
- the risks to consumers and other public interests are managed
- the market structure is amenable to the privatisation
- the sale is conducted efficiently, ethically and transparently.

The Commission is also recommending that the Australian Government scope whether there are net benefits from privatising Airservices Australia, Snowy Hydro and the Australian Rail Track Corporation.

Privatising other government businesses should only occur following a scoping study that demonstrates there are net benefits in the form of efficiency gains from doing so.

The proceeds from privatisation should only be invested in new public infrastructure if rigorous and transparent cost–benefit analysis demonstrates there are substantial net social benefits to the community — exactly the same requirements when procuring new infrastructure not supported by privatisation. Otherwise, the proceeds from privatisation may not be wisely invested, leading to suboptimal outcomes.

Improving institutional and governance arrangements

Reforming institutional and governance arrangements for the provision of public infrastructure is necessary to promote better decision making in project selection and the efficient funding, financing and delivery of public infrastructure services.

Governance arrangements

All governments should adopt institutional arrangements for the provision of public infrastructure that incorporate best-practice governance principles and policy processes (as described in recommendation 7.1).

The Australian Government should make eligibility for Commonwealth funding to other tiers of government conditional on compliance with these governance principles and policy processes to facilitate their adoption. The best practice governance arrangements should also apply under all funding or financing mechanisms. This includes circumstances where government support for public infrastructure is provided through grants, or allocation from a fund, or through other forms of support (such as loans or guarantees).

Care should be taken to ensure that obligations placed on local governments are proportionate to both the funds the Australian Government provides and the capacity of individual local governments to comply with those obligations.

To facilitate compliance with the conditions, relevant skills and capabilities should be shared within jurisdictions and between levels of government.

The governance arrangements for a reformed Infrastructure Australia (or any advisory body on public infrastructure) should be consistent with the best practice policies and processes outlined above. The normal expectation should be that tendering for a government contract will result in public disclosure of cost–benefit analysis and all other relevant information supporting a project proposal.

In keeping with the best practice principles and to ensure a common credible framework, the Australian Government should apply the governance framework to its own projects.

Project pipeline

Some participants have suggested that there needs to be a ‘pipeline’ of public infrastructure projects. There are different views about what constitutes an effective pipeline. In the Commission’s view, the package of reforms advocated in this report should lead naturally to the disclosure of considerable information, such that public funders and private financiers would have a reasonable indication of the detailed analysis supporting future public infrastructure priorities. This would constitute an effective ‘pipeline’, with the capacity to naturally update itself.

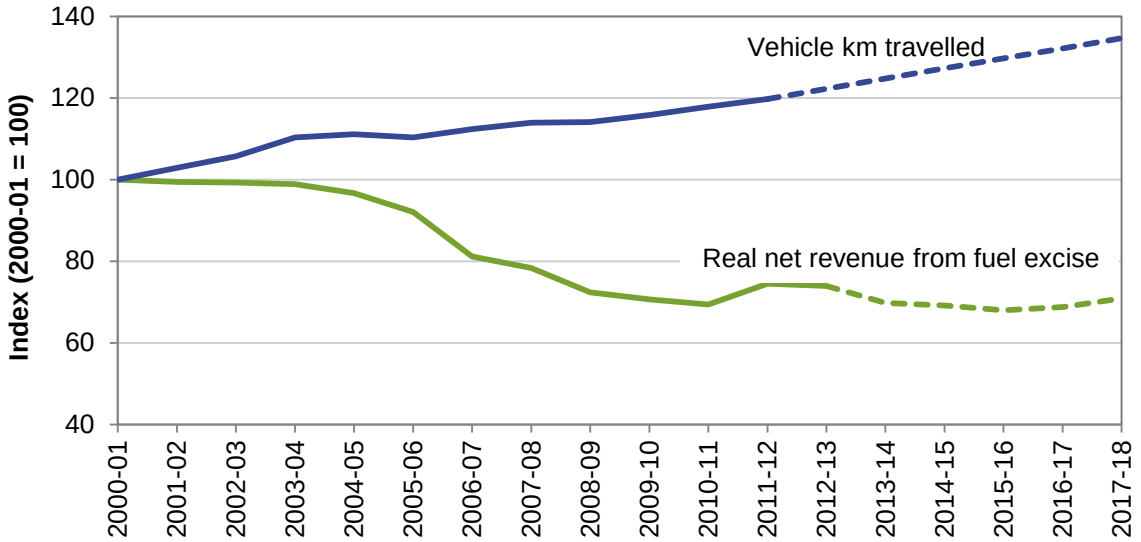
Governments could choose to regularly update and publish their list of priority projects. The Commission notes that the Australian Government has asked

Infrastructure Australia to publish a 15-year infrastructure audit plan, which will add to the public information on proposals, but does not deliver the pipeline that would be created by comprehensive publication across all governments of cost–benefit analyses on proposed public infrastructure projects.

Alternative institutional arrangements for road provision

Current governance, taxation and institutional arrangements for the funding and provision of roads are presenting challenges for coherent long-term planning and investment in road infrastructure, and are ultimately unsustainable. There is no direct link from road-related revenue to road-related expenditure. This makes it difficult to determine road users' preferences and willingness to pay for road infrastructure services. It is also notable that net revenue from fuel excise — currently one of the largest sources of funding from motorists — has been lagging well behind growth in road use and the unit cost of building and maintaining roads. It is likely that this situation will continue, despite the recent decision to resume indexation of the excise rate from August 2014 (figure 2).

Figure 2 **Road use and fuel excise**



Under current arrangements, investment in roads is subject to political pressures arising from annual budget processes and election cycles. Decisions are often based on inadequate and non-transparent information and assessment of the costs and benefits of road projects.

If investment in roads is to be made sustainable with the expected high level of future urban development in Australia, there is a pressing need to commence the

task of moving towards alternative institutional and governance arrangements in the roads sector.

The adoption of a well-designed road fund model or a corporatised public road agency model is paramount to delivering net benefits from the funding and provision of roads. In the future, road funds may be able to consider direct road user charges, which would facilitate more effective asset utilisation and more rigorous assessment of new investments.

It is imperative that any institutional framework includes direct involvement of road users and a transparent process of community consultation. This will help to ensure that road investments are being directed to areas that provide the highest value to the community, and also help to facilitate community acceptance of more direct road user charging schemes.

The road reform process is likely to be a long journey, requiring effective coordination and significant commitment and effort from and across all levels of government to build public support. This is similar to the long process that built bipartisan support for trade liberalisation.

In this context, the first step in the reform process should be the establishment of road funds by State and Territory Governments and aggregations of local governments. The road funds should integrate the tasks of road funding and provision into one entity, to enable road charging and provision to be more effectively considered on a regional portfolio basis.

In light of the recent decision to bring back into government hands the Heavy Vehicle Charging and Investment Reform (HVCI) project, there is scope for a road fund model to incorporate road funding and provision for both heavy and light vehicles. There would be benefit in adopting a combined approach given that many roads and associated investment decisions address the needs of both light and heavy vehicles.

The Commission acknowledges the extensive work undertaken to progress both charging and institutional reform for heavy vehicles by the HVCI reform project. The analysis and lessons from the HVCI reform process will be directly relevant to the planning, development and implementation of this inquiry's recommended concept of road funds.

State Governments and local government associations should actively encourage and support local governments to form regional road funds for local roads. They could do this through capacity building mechanisms (such as providing specialist expert and technical assistance), and ensuring there are no legislative impediments

to the forming of funds or to developing betterment options or other cooperative arrangements.

The principal role for the Australian Government in the development of road funds should be to provide strong practical support for jurisdictional reform. This could include offering scope for redirection of resources to the new road funds and the provision of analytical and research capabilities. Hypothecation of funding will become a relevant question in this role.

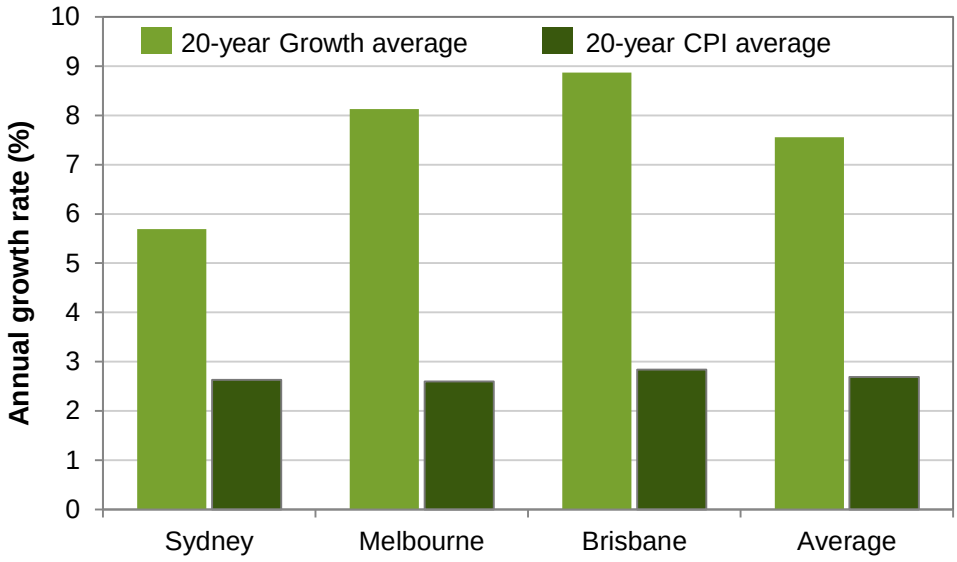
Public infrastructure construction costs

Some commentators have argued that Australia's infrastructure construction cost performance is poor by international standards, and that Australia has become a 'high cost, low productivity' location for major project construction. They suggest that project costs have escalated strongly over the past decade. If true, this would increase the prices for public infrastructure and reduce Australia's capacity to invest in public infrastructure.

The story is more nuanced and uncertain than this (especially as official statistics often do not separate infrastructure construction from construction more generally), though some facts are clear:

- prices for engineering construction projects (*excluding land prices*) rose steeply over the decade from 2000 and at an accelerating rate. But that trend has recently abated. This pattern is not unique to construction. Competition for scarce resources associated with the resources construction boom appears to have generally increased input costs, and now that the boom is over, price and cost growth rates are low. The cyclical impact of the global financial crisis also had a short-lived (negative) impact on costs and prices
- there is no single culprit for such construction cost increases. Labour costs have risen steeply, particularly for (largely non-unionised) engineering design and consulting services. But, so too have material input prices, which sometimes reached double figure growth rates in the mid-2000s. For the construction industry as a whole, the labour *share* of total costs has not changed appreciably over the past two decades
- while land prices are often excluded from many measures of construction costs, the prices for large public infrastructure include land costs. These have risen much faster than prices in the economy generally (figure 3). They also vary significantly by region and state, so project location can make a large difference to costs.

Figure 3 **Land prices have risen well above inflation — 1993 to 2012**



There remains considerable uncertainty about many facets of construction costs. There are sometimes large and inexplicable variations in the construction costs for what appear to be similar activities, such as the cost per kilometre of rail projects (figure 4).

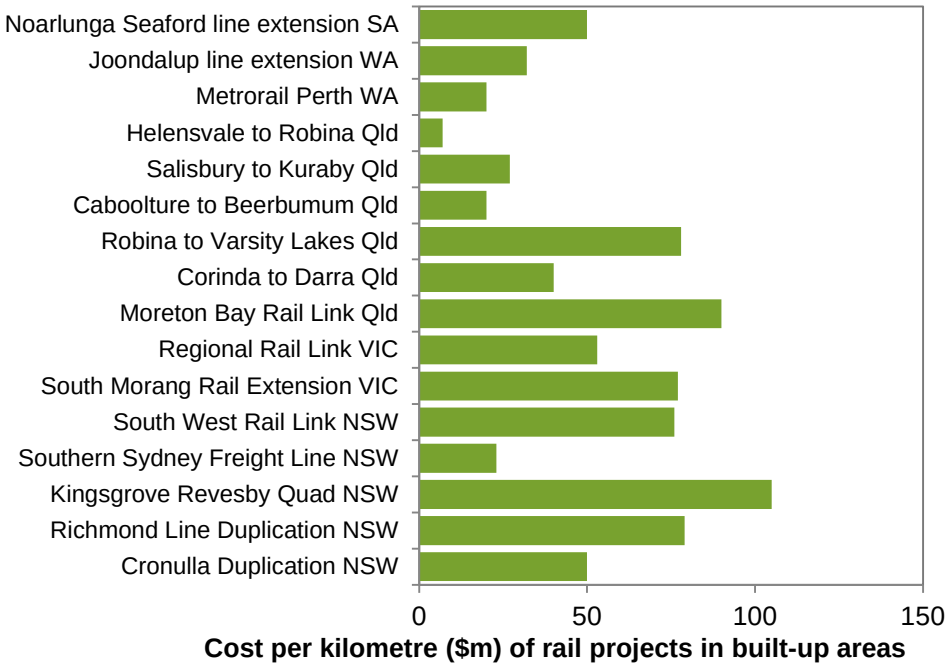
It is likely that many of these variations reflect the differing costs of brownfield construction and, as shown later, procurement competencies and individual labour relations on sites. What lies beneath the soil (toxic materials, power, water and sewerage infrastructure) and what lies above (existing buildings and roads) can make a large difference, as can the varying costs of addressing the disruption to a city from major projects and environmental impacts. Sometimes there is no choice but to build infrastructure underground, especially if former reserved corridors have been sold. Tunnels are expensive (as the construction of the Sydney North West Rail Link revealed).

There is also considerable uncertainty about whether Australia is a more costly location for infrastructure than other *comparable* countries. Making comparisons with low-wage countries makes little sense. Other than when industrial relations in the industry raise wages unduly above other industries (a genuine issue), it would not be possible to set lower wages in the construction industry and retain workers. And reducing wages across Australia to make construction costs lower seems to be putting the cart before the horse, since most Australians want to live in a high-wage economy.

For comparable countries, it is not evident that Australia is more costly, as shown by various benchmarking exercises for specific project types. For instance,

Australia had lower costs per square metre for comparable airport terminals than the United Kingdom and (most) large cities in the United States.

Figure 4 **Rail construction costs vary enormously**



Moreover, at least when cost overruns are concerned (an indicator of project management and estimation), Australia is a significantly better performer for some forms of infrastructure. As an illustration, the average cost overrun for a sample of 12 roads in Australia was 10 per cent. The international benchmark (covering nearly 170 projects) was double this. Of course, this need not mean that Australian road construction costs are necessarily lower than those of our international peers.

Overall, while some relatively clear aggregate patterns emerge from the available data, the micro data that would systematically explain the sources and nature of cost pressures in 'like-with-like' projects in Australia and overseas is missing or incomplete. To some extent, this difficulty reflects the bespoke character of many major construction projects but the main difficulties generally appear to arise from inadequate and poorly coordinated data collection. This is not an academic concern. Governments experimenting with different policies for funding, financing, procurement approaches, planning and industrial relations need to know what difference their choices make to ultimate construction project costs. Without the data, they will learn more slowly or not at all.

The Commission recommends that the Australian Government should introduce a detailed benchmarking framework. Infrastructure Australia would oversee public

reporting of benchmarking results across Australia for major infrastructure construction projects covering transport, energy, water and social infrastructure. It would outsource the development of the benchmarking framework to agencies expert in the relevant areas. For example, the Bureau of Infrastructure, Transport and Regional Economics would be responsible for benchmarking of transport infrastructure (the dominant type of public infrastructure). State and Territory Governments will have an important role to play in, and be primary beneficiaries of, such benchmarking. It will improve the information base for their infrastructure tendering, and significantly improve ex post evaluation. The provision of data by State and Territory Governments should be a requirement for all projects where the Australian Government provides funding.

One of the major drivers of long-run construction costs in infrastructure is the achievement of productivity gains. Accordingly, it is important to understand Australia's performance in this area, and to assess the factors contributing to it.

Productivity

Over the past 30 years, labour and multifactor productivity growth has ebbed and flowed in the construction industry, with a long period of stagnation in the decade from the mid-1980s. Productivity has trended up since then, but much of the increase occurred in relatively short bursts. Rising capital intensity has partly contributed to higher labour productivity growth rates from the mid-2000s. The most exceptional feature of the last few years was the surge in measured MFP and labour productivity (of over 10 per cent) in 2011-12. Its source and credibility is uncertain, but will partly have reflected the compositional shift to engineering construction.

The international evidence about Australia's relative performance is patchy and contradictory, and is reliant on case studies in parts of the industry, and indirect measures of factors correlated with productivity, such as the commitment to R&D development. For example, Australian construction companies are relatively more R&D intensive than their overseas peers. Australia has also grown its exports of construction technical services strongly, suggesting globally competitive capabilities in this part of the industry. But other case studies paint a more mixed picture of Australia's recent productivity performance in particular areas of infrastructure construction.

Regardless, there was a widespread view that there was scope for more innovation and diffusion of new technologies in the industry. However, any such improvements are largely in the hands of businesses and driven by competition and commercial

imperatives. Beyond any regulatory reforms to address policy barriers to innovation, the most important role governments can play is by being demanding and informed customers that are willing to pay for, and contribute to, innovative design and engineering solutions.

Procurement — Is it true that a 'good customer is hard to find'?

While government clients have sought to continuously improve their procurement practices, the Commission's consultations suggest that there are substantial dividends from reforms to project scoping and design, appropriate due diligence and probity management, avoidance of overloading tenders with unnecessary obligations and, as an overarching requirement, increasing their sophistication as buyers and negotiators.

Bidding costs can come down

Bidding costs for large complex projects are high — up to 1 per cent of the project value. It is desirable that some bidding costs exist — they are an investment by the businesses and the customer in the selection of the best constructor, and a mechanism for feedback on good design and innovation. However, bid costs still appear too high in Australia. A major contributor to this is that the preparatory work that would most efficiently be undertaken by the client has been outsourced to prospective constructors. The Commission advocates that clients should:

- invest more in initial design to reduce the design imposts placed on tenderers, while making key project standards contestable
- on a case-by-case basis, contribute to the bid costs of tenderers where innovation is assessed as being genuinely in prospect, in return for ownership of the design so that key innovations from unsuccessful tenderers are not 'lost' and incentives for innovation remain strong
- alter the timing of tender documentation such that only cost-relevant plans (such as those relating to design) are demanded of all bidders, with the remaining (of which there are many) being a condition of the tender, but only required of the preferred tenderer.

These solutions rely on government clients becoming more informed about the project they are wishing to purchase and for clients not to rush to market with untested scope documents. The importance of informed customers has equal relevance to other forms of government contracting. For example, for PPPs, the patronage risk analysis, undertaken by governments and any other information

relevant to project risks should be provided to potential bidders to lower bid costs and elicit better costed bids.

Eliciting best value-for-money bids

Even with low bid costs, the design of the procurement process may result in the selection of a constructor and design that does not provide the best value-for-money for the client and ultimately the community. The way in which tenderers are shortlisted (and their number), including the assessment of new international entrants, the information used to assess the designs and other procurement 'rules', all have the potential to influence the final tendered cost of a project.

It is important that the shortlisting of possible tenderers does not focus excessively on *local* experience, as this would deter bidding by potentially better international suppliers (which are taking a greater interest in the Australian market).

Government clients also have substantial scope to improve the quality of the information used to assess tenders. Superior information can provide a better understanding of whole-of-life project costs and potentially lower construction costs. To this end, a modelling approach (so-called 'Building Information Modelling' or BIM) has been shown in other markets to generate construction efficiencies and provide higher quality information on possible costs beyond the construction phase for complex projects. Given the potential savings from BIM, government clients should consider provision of initial designs in a BIM format when the project is of sufficient complexity to provide for lower construction costs and the selection of the lowest 'whole-of-life' design option. This will typically apply to projects that involve large building works, but less so to flat structures, surface road and rail projects. Governments, in consultation with industry and other private sector procurers, should coordinate the establishment of common technical standards to ensure that the greatest benefits from the adoption of BIM are realised.

Other government rules on procurement have the potential to lead to perverse outcomes. Local content plans, specifically Industry Participation Plans, while not binding, add to bid costs and have questionable underpinnings. The requirement for such plans should cease. There are already policies with a sounder basis that increase the capabilities of Australian businesses (such as various R&D programs).

Similarly, excessively tight rules on probity — a form of inefficient or excessive risk aversion — can inhibit the selection of the best tender and perversely increase the risks to government. The main purpose of probity rules is to ensure that the selection process for constructors is genuinely based on merit. However, particular

ways of achieving due diligence can increase the time and costs of procurement processes, and frustrate superior procurement options for some projects.

Project management

Once the client has identified the successful tenderer, the operation of the contract is critical in determining final project costs. Contracts contain various pecuniary incentives for contractors to identify options that minimise construction cost, but proper project oversight by the client remains an important role. An informed and competent client has a better capacity for oversighting claims for variations and ensuring compliance with the contract. Some participants in the inquiry suggested that public sector project management was poor, citing large cost overruns on some key public sector projects.

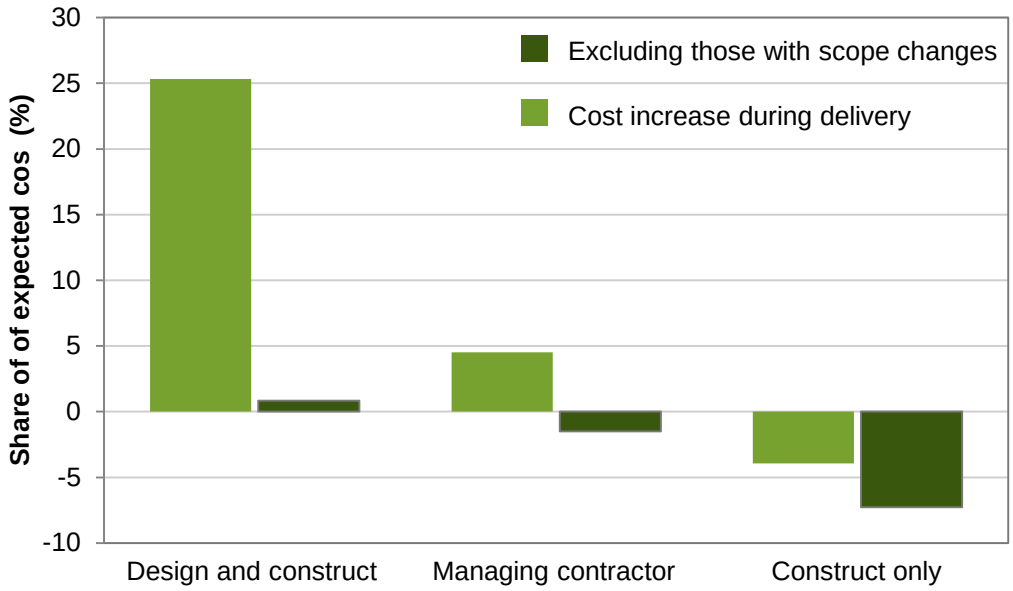
However, it is important to differentiate between project scoping, pre-tendering project planning and specification and the client's project oversight that commences after the construction contract has been signed. Some evidence suggests that poor initial cost estimation and then scoping errors lead to cost overruns, and that the project management phase generally proceeds well. In Western Australia, for example, the Auditor-General has estimated that 90 per cent of the cost variation of the top 20 non-residential capital works projects completed by 2012 (representing $6.2 billion in spending) reflected early estimation errors. Also, analysis conducted by the Commission shows a strong link between overruns in the project selection and scoping stage, and those during construction. This highlights the flow on effect of poorly developed projects on the turnout costs of infrastructure projects.

Evidence on cost overruns due to poor project management is mixed. While the frequency of cost overruns by government clients is greater than private sector procurers, when there are cost overruns, their extent is lower. Further, where costs do overrun the contracted amount, it is often because the government client changed the scope of the project after contracts were signed (figure 5).

Nevertheless, even governments have acknowledged that project management has sometimes been deficient (as has procurement more generally). A common element to all cost overruns by public and private clients is project size and complexity. Large projects are often subject to greater uncertainties (and for government clients, the potential for the intrusion of political factors), which increases the scope for error. To help overcome some of these issues, several governments have developed specialist major procurement agencies. These manage infrastructure procurement on behalf of government clients that only occasionally purchase capital works. The Commission sees merit in adopting this approach across all Australian jurisdictions

to improve the quality of procurement-related advice and expertise in the public sector.

Figure 5 **Cost overruns during delivery mainly stem from government clients changing the scope of the project**[a]



[a] Cost overruns are defined as the difference in actual project costs as a percentage of the expected project costs at the time of contract signing.

Does the market structure for large projects lead to construction cost increases?

Many parties cite the presence of an apparent duopoly in the 'tier 1' segment of the market — Leighton Holdings and Lend Lease Group — as contributing to high infrastructure prices. Following a series of mergers and acquisitions, these businesses have emerged as the main players in the Australian infrastructure construction market — especially for the large infrastructure projects that are the focus of this inquiry. While estimates vary, these corporations and their subsidiaries collectively enjoy a significant market share. Some stakeholders claimed that risk aversion by some government purchasers led them to prefer the incumbents, contributing to the dominance of these two players.

Of course, a large market share by a few players does not necessarily lead to high prices or weak competition. In this regard, the Australian Competition and Consumer Commission has not found cause to block any of the acquisitions or mergers of Leighton Holdings or Lend Lease, nor has it taken action against them for anticompetitive conduct.

While there are some (low-level) barriers to new firms entering the market, it appears to be largely contestable. Indeed, international contractors (primarily from a depressed European market) are increasingly active in Australia, placing competitive pressure on the incumbents. For example, the four kilometre long elevated skytrain contract of Sydney's new North West Rail Link, costing around $340 million, was awarded to an Italian-based construction company. Similarly, two foreign contractors and a local second-tier constructor are constructing the Northern Link tunnel in Brisbane (costing around $1.5 billion).

This competitive pressure can be further developed by adapting work health and safety accreditation processes for international market entrants. Options such as provisional accreditation for firms with good safety records abroad may add to competition in the market.

While the concentrated structure of the market neither appears to inhibit competition nor increase construction costs, some uncertainties remain. For instance, there may be insufficient competition to adequately constrain prices in some parts of the market because the broader market is segmented by the type, location and size of projects. The cost impacts are unclear.

Governments can partly address any residual concerns through smart procurement strategies, for example by:

- using its large and ongoing purchasing activities to discourage excessive pricing behaviour
- packaging major projects into smaller parts to increase the number of potential bidders where the benefits outweigh costs
- taking into account that project scheduling can make a large difference to the number of potential bidders for big projects (and therefore the prospects for genuine competition)
- penalising market participants that engage in 'sweetheart' deals with unions (which raises costs and may limit competition).

Industrial relations

The industrial relations (IR) environment in construction has long been seen as problematic. It exhibits greater than average levels of industrial disputes. There are concerns about excessive union control of work sites and expedient deals between head contractors and unions to buy industrial peace and preserve the market advantage of good relationships. Multiple reviews have found unlawful (and sometimes criminal) conduct in some parts of the industry — mainly involving

larger commercial building projects rather than infrastructure projects. A prominent concern is that union and employer behaviour is not only fuelling unlawful conduct, but also frustrating productivity and raising costs.

The systemic problems affecting core parts of the sector have fuelled industry-specific arrangements, including IR building guidelines and the creation of industry-specific regulators.

However, to place these concerns in context:

- in the Commission's meetings with stakeholders and in submissions, most parties did not raise IR issues as a major source of cost pressures for civil and engineering construction, which is the dominant form of construction for public infrastructure
- while days lost per employee are higher than most other industries, they are very low by historical standards. They fell somewhat during the early years of the Australian Building and Construction Commission (ABCC), but then rose (albeit to levels that are still low by the historical standards of the industry)
- unionisation continues to fall, and is now at record lows
- higher productivity growth rates in the aggregate construction industry do not appear to be associated with the construction-specific IR arrangements that commenced in 2002
- while union bargaining power appears to have increased wages significantly for some projects and jurisdictions, labour earnings growth over the last decade also reflects labour shortages associated with increasing demands for construction. There is evidence that current enterprise bargaining rounds could lead to a reduction in labour costs
- an important aspect of the outcomes in IR is not regulatory. The competence of the parties to negotiate with each other is important. Governments can adjust institutions, but cannot directly improve the capabilities of the IR managers in construction companies.

Notwithstanding this, there are still considerable concerns.

- Cases prosecuted by the Fair Work Building and Construction (and formerly the ABCC) continue to reveal unlawful conduct (mostly of a civil nature) and adverse IR cultures. Overwhelmingly the issues centre on general, rather than civil and engineering construction, with cases concentrated in Victoria and most often involving just one union, the Construction, Forestry, Mining and Energy Union. It is important in that context to avoid generalising the flaws and follies

of an industrial relations environment spanning such a patchwork of businesses, unions, project types and jurisdictions.

- Most recently, allegations of bribery between constructors and unions have emerged, and are the subject of the Royal Commission into Trade Union Governance and Corruption.
- There is evidence of potentially excessive powers for some union officials and constraints on workplace flexibility likely to be inimical to productivity.
- Analysis of enterprise bargaining agreements (EBAs) suggest large and inexplicable variations in terms and conditions for employees. For example, there were large wage premiums associated with the construction of desalination plants throughout Australia. This might reflect the urgency with which these projects proceeded (and the resulting bargaining power bestowed on the relevant unions). More generally, some caution needs to be exercised when analysing EBAs, as they only can ever reveal part of the information set necessary to fully appreciate the bargaining environment at the time they were struck.
- The nature of the construction projects provides unions with significant leverage, which they sometimes abuse. Businesses are exposed to large delay penalties, and high costs if construction work is interrupted (such as a concrete pour).
- For particular projects, the nature of the project, the relevant union and delegates, the negotiating competencies of parties, and the incentives of the head contractor can lead to highly costly, combative and problematic outcomes. So while many projects may not be dogged by problems, some have involved toxic relationships.
- Further, the capacity for parties to negotiate enterprise bargains that suit the circumstances and preferences of individual businesses and their employees has been partly subverted. Various pressures by employee associations and the principal unions can lead to the implicit adoption of pattern bargaining, which leads to the same agreements across relevant parts of the entire industry. Greenfield agreements for a particular project struck between a union and a head contractor can also stifle the potential for subcontractors to negotiate EBAs suited to their own circumstances. Each of these factors can inhibit productivity growth.

Most industry participants and business bodies argued for the replacement of the current industry-specific industrial relations regulator, Fair Work Building and Construction, with the preceding body, the Australian Building and Construction Commission (ABCC). The latter had greater coercive powers, higher penalties, and the capacity to still investigate matters where the union/s and an employer had reached an agreement after an industrial dispute.

The evidence that the ABCC stimulated material improvements in *aggregate* productivity or achieved cost reductions is weak. But the debate about the aggregate productivity numbers alone misses several important points about the effectiveness of the ABCC.

The ABCC is likely to have had its primary impact on unlawful conduct and on local productivity and costs at particular sites. These are important effects that are hard to find in the aggregate data. Moreover, a major goal of reform is to ensure that parties are confident that IR regulations, agreements and contracts are observed.

Strengthening of regulatory responses is clearly needed, but the industry itself needs to embrace changed behaviour.

A sensible starting point is for all jurisdictions and the Australian Government to deploy the Victorian guidelines (or something akin to them) for their building codes of practice. Breaching the guidelines would potentially disqualify contractors from tendering for public infrastructure projects if they had mismanaged their industrial relations arrangements or had reached 'sweetheart' deals with unions that precluded competition from sub-contractors with lower wage costs.

The Commonwealth could encourage the Australia-wide adoption of such guidelines in several ways:

- where the Commonwealth is the procurer (say, as in the National Broadband Network), it would apply the new guidelines to its tenderers
- where the Commonwealth is a funder of state projects, it would require compliance with a code and guidelines embracing the Victorian principles as a precondition for funding.

In addition to this measure, there are also grounds for raising the ceiling for penalties for unlawful conduct. This would enable the Federal Court to set penalties more commensurate with the economic damage of industrial unrest, or to provide greater deterrence where there was recurring recidivism by an employer, employee or union for unlawful conduct.

Adoption of the guidelines and higher penalties would be likely to significantly improve the industrial relations environment and avoid industrial disputes and excessively generous enterprise bargaining agreements.

Skill formation and shortages

Based on current evidence, it is unlikely that skill shortages are a major cost driver for large infrastructure projects. However, they have some bearing on wage costs, can cause project delays, and affect the competitiveness of subcontractors. A survey of engineers showed 11 per cent of respondents observed cost increases or delays caused by skill shortages. Around 3 per cent saw projects that did not proceed due to skill shortages in 2012 — down from 8 per cent in 2008 and 2009.

Several occupations relevant to infrastructure construction, including engineers, technicians and operators, have been in apparent shortage at various points since the early 2000s. The persistence and severity of the shortages have differed across occupations, levels of experience and seniority, and jurisdiction. However, the most recent data suggests shortages are decreasing.

No single policy can address all skill shortages in construction and, indeed, it would not be feasible or cost-effective to avoid skill shortages during transient boom periods. Rather, policy should aim to reduce the occurrence of skill shortages and their effect on businesses. One complicating factor is that most occupations are highly specialised, requiring years of experience before reaching proficiency. The shortage of engineers has been strongest for those with 14 to 18 years' experience. The need for experience is greater for major projects.

The intermittency of construction projects has been one of the most important drivers of skill shortages in infrastructure construction. Intermittency makes it difficult to retain staff, reducing the number of people with industry-relevant experience. It also reduces an employer's incentive to invest in staff training, especially the incentives to take on new apprentices. This will then have flow-on effects on future skill availability. In part, such diminished incentives are addressed by various arrangements that fund training. However, the short- and long-term effectiveness of many of the apprenticeship programs (in construction and more generally) have not been assessed for some time. The Commission believes a more systematic review of apprenticeship arrangements for all industries is warranted.

Consistent occupational licensing across jurisdictions would also improve geographic labour mobility, providing one avenue for addressing regional shortages. The men and women who work as tradespeople, their clients and their employers have been poorly served by the lack of progress in producing consistent occupational licensing across jurisdictions.

Some stakeholders have argued that the impact of intermittency on skill formation should be resolved through orchestrating a predictable, continuous pipeline of public infrastructure projects. As outlined earlier, the Commission considers that

implementing the broad suite of recommendations in this report will result in a more coherent, economically-justified pipeline of projects that will form a more robust basis for forecasting the demand for skills and therefore, their creation.

Social and environmental regulation

Public infrastructure projects are subject to an array of 'non-economic' regulations, covering matters such as pollution control and waste management, biodiversity, heritage, native title, land access and usage, and noise levels and urban amenity. The regulations are typically coupled with requirements for community consultation, planning, pre-project assessments and approvals. The scope and stringency of these regulations and requirements have escalated over time.

While regulation is necessary to achieve many social and environmental objectives, unnecessary costs can arise where regulations are over-specified, duplicate existing requirements or are in other ways poorly designed, coordinated and/or administered. For example, approval delays can create major costs for projects, imposed on the financier (often the Government), and reduce the benefits to the community from the deployment of infrastructure. Where approval processes can be expedited without sacrificing their coherence and efficacy, there are likely to be significant gains to the community.

There is substantial scope to rationalise and improve the web of regulations and approval processes in the infrastructure construction sector. The Commission has identified many such opportunities in its recent study of development assessment processes for major projects. In addition to recent actions to reduce overlap of national and state environmental approvals processes, Australian governments continue to consider that study's wide-ranging recommendations for reform.

Reform can begin immediately and will produce large economic benefits

A central message from this report is that there is scope for individual governments to act immediately on many of the Commission's suite of recommended reforms. In a large proportion of cases, the necessary steps for reform are reasonably well understood and can be implemented without a national agreement or coordination between jurisdictions.

Governments (including the Australian Government) should proceed to commit to and implement the relevant reforms in their own jurisdictions without delay. This

will lead to the adoption of improved frameworks, governance arrangements and processes for the provision of public infrastructure within each jurisdiction.

Some of the reforms that should be initiated immediately include:

- more thorough consideration of alternatives to infrastructure provision that achieve the same policy goals (for example, traffic flow management with the intelligent use of traffic lights, peak hour road closure and the introduction of ramp metering among other options)
- improved project selection. Even election commitments to build and/or fund major infrastructure should be subject to rigorous project assessment and selection after the election. White elephants should become an endangered species
- pricing reform for those areas of infrastructure that are already amenable to it, which would provide a revenue source for infrastructure funding, and provide a signal about where and when to make investments
- a clearer idea about the pitfalls and lessons of different funding and financing models, which could avoid some of the mistakes of the past
- privatisation, where it improves investment and operational efficiency, and only after governments have determined the essential elements of the policy and any efficient economic and other regulatory frameworks that will be faced by the businesses post-privatisation
- the development of greater procurement competencies, and introduction of cost-reducing tender process improvements
- the adoption of procurement guidelines to provide incentives for better industrial relations arrangements.

Jurisdictions should also commence consideration of the road fund model as soon as possible, with each advising the Australian Government of how it can best support its reform as early as possible.

Early reform will deliver large benefits for the community. Based on recent levels of investment, a 10 per cent reduction in the cost of delivering infrastructure — a conservative estimate of the potential savings from implementing sensible reforms — would amount to an annual saving of around $3.5 billion (and that would grow over time). A goal to achieve just a portion of this, say $1 billion per annum, would be quite feasible.

Coordination and agreement between jurisdictions

Implementation of some of the reforms could benefit from a level of coordination and cooperation between jurisdictions. The active support of Australian Government Ministers responsible for various types of infrastructure will also be an important factor in progressing reforms at the state, territory and local government levels.

As a means of achieving this, and while not a prerequisite for any of the reforms proceeding, there would be further benefit in incorporating a subset of them in a national agreement, or a series of formal bilateral agreements between the Australian Government and the relevant State or Territory Government.

The Commission does not oppose a national agreement in support of aspects of these reforms that can benefit from nationally coordinated activity. However, it is conscious of significant differences between jurisdictions in their level of privatisation, preparedness to embark on large new infrastructure programs and funding flexibility.

Bilateral agreements may be more suitable to rapid implementation as the Australian Government could negotiate and agree early with those jurisdictions whose circumstances make this most desirable. This may create bilateral model agreements that could be rolled out by other jurisdictions sequentially; or be adapted to meet the specific characteristics of individual jurisdictions. The reforms proposed are for the long term. The time needed by different jurisdictions in seeing them adopted should be expected to vary.

Recommendations and findings

Better institutional and governance arrangements are crucial

FINDING 7.1

Institutional and governance arrangements for the provision of much of Australia's public infrastructure are deficient and are a major contributor to unsatisfactory outcomes.

FINDING 6.1

Where project selection decisions are made in accordance with the framework recommended in this report, there is additional capacity for the Australian and State and Territory Governments to finance public infrastructure through borrowing.

RECOMMENDATION 7.1

All governments should put in place best practice institutional and governance arrangements for the provision of public infrastructure. This includes:

- ***clearly defining the principal objective of ensuring that decisions are undertaken in the public interest, taken to be the wellbeing of the community as a whole***
- ***setting clear and transparent public infrastructure service standards***
- ***instituting effective processes, procedures and policy guidelines for planning and selecting public infrastructure projects, including rigorous and transparent use of cost–benefit analysis and evaluations, public consultation, and public reporting of the decision***
- ***use of transparent, innovative, and competitive processes for the selection of private sector partners for the design, financing, construction, maintenance and/or operation of public infrastructure***
- ***ensuring efficient allocation and subsequent monitoring of project risks between government and the private sector***

- ***regularly reviewing funding and financing policies, including application of transparent user-charging mechanisms as the default setting where this is efficient***
- ***monitoring of project performance and ex-post independent evaluation and publication of project outcomes (including periodic reporting of benchmark costs by Infrastructure Australia)***
- ***retaining sufficiently skilled public sector employees to be responsible and accountable for performing these functions***
- ***establishing mechanisms for transparent review or audit of the decision-making process by an independent body, for example, an Auditor-General or Infrastructure Australia.***

RECOMMENDATION 2.3

All governments should commit to subjecting all public infrastructure investment proposals above $50 million to rigorous cost–benefit analyses that are publicly released and made available for due diligence by bidders. In general, analyses should be done prior to projects being announced. If a project is announced before analysis is done, for example, in the lead-up to an election, this should be conditional on the findings of a subsequent analysis.

RECOMMENDATION 7.3

Australian Government funding or other forms of financial assistance (including incentive payments under Commonwealth–State agreements) for public infrastructure that is provided to State and Territory and Local Governments should be conditional on the adoption of the governance arrangements outlined in recommendation 7.1.

This assistance should only be provided where there is evidence of a demonstrable net public benefit from the project that would otherwise not be obtainable without Australian Government support.

The Australian Government should support the incorporation of the framework in recommendation 7.1 for project assessment in the energy network investment framework.

Consultation on the criteria to be applied and any potential implementation issues associated with such an approach should be undertaken with the State and Territory and Local Governments.

Various public and private financing models may have a role to play

RECOMMENDATION 2.1

State and Territory Governments should privatise their government-owned:

- ***electricity generation, network and retail businesses***
- ***major ports.***

Privatisation should be subject to appropriate processes to ensure that the public interest is protected through structural separation, regulation, sale conditions and community service obligations.

RECOMMENDATION 2.2

The Australian Government should conduct scoping studies to investigate the efficiency gains and other merits of privatising some or all of the business activities of the Australian Rail Track Corporation and Airservices Australia. The study into Airservices Australia should include a review of the efficiency of its capital expenditure program, as recommended by the National Commission of Audit.

The Australian, New South Wales and Victorian Governments should similarly investigate the sale of Snowy Hydro. Sale of shares by any one of these governments should not depend on the decisions made by the other governments.

RECOMMENDATION 6.1

Governments should undertake pilot procurement programs without the requirement for bids to be fully financed at the time of tendering for the project.

RECOMMENDATION 5.1

The Financial System Inquiry should investigate characteristics of Australia's corporate bond market to identify whether there are factors impeding its development that could be corrected by policy action and provide a net benefit to the community.

Road-specific institutional and funding reforms are required

RECOMMENDATION 8.1

The first step in a long-term transition to a more efficient and effective approach to the provision and funding of roads should be the establishment of Road Funds by State and Territory Governments. State Governments, and local government associations, should actively encourage and support local governments to form regional Road Funds for networks of local roads.

To be effective, Road Funds should:

- ***have the objective of clearly linking road-user preferences with investment and maintenance decisions***
- ***integrate the tasks of road funding and provision***
- ***have a significant degree of autonomy***
- ***have access to adequate revenue to meet the costs of the road network they administer, as required by the relevant road users***
- ***entail transparent processes for determining the level and allocation of funds***
- ***include an open and transparent procedure for direct involvement of road users and consultation with the broader community on project selection, funding, and road charging decisions***
- ***involve systematic post-project evaluation and periodic review of the arrangements.***

The implementation of Road Funds should take into account the research and analysis developed for heavy vehicles by the Heavy Vehicle Charging and Investment reform project.

RECOMMENDATION 8.2

There are complex issues associated with establishing Road Funds, such as determining what sources of road revenues should be directed to Road Funds (including Australian Government road revenues) and the method of allocation.

The Australian Government should assist in this reform effort by directing the Productivity Commission to undertake a public inquiry on the design and implementation of Road Funds.

RECOMMENDATION 4.1

The Australian Government should actively encourage State and Territory Governments to undertake pilot studies on how vehicle telematics could be used for distance and location charging of cars and other light vehicles. To do so, the Australian Government should:

- ***offer to partly fund these pilot studies***
- ***work with the States and Territories to address privacy concerns and share lessons from the trials and overseas experience***
- ***ensure that motorists are directly involved via roads and motorists associations.***

The pilot studies should be designed to inform future consideration of a shift to direct road user charging for cars and other light vehicles, with the revenue hypothecated to roads. Heavy vehicle trials could also be developed on a similar basis.

The Road Funds proposed in recommendation 8.1 could be tasked to undertake the trials if this does not result in unreasonable delay.

Planning and tendering arrangements can be significantly improved

RECOMMENDATION 9.1

Given high and rising land costs in urban areas, Australian governments should ensure that project selection take explicit and detailed account of available alternatives, including the enhanced use of existing infrastructure, pricing solutions and cheaper build options. Australian governments should also consider ways in which land policies can be improved in this area, given the deficiencies in the current planning of land reservation in most jurisdictions in Australia.

RECOMMENDATION 12.1

All governments should invest more time and resources in the initial concept design specifications to help reduce bid costs, but in doing so, provide opportunities in the tender process for tenderers to contest the specifications of the design.

RECOMMENDATION 12.2

When tendering for major infrastructure work under design and construct arrangements, government clients should consider contributing to the design costs of tenderers on the condition that governments own the design, where a thorough prior assessment has demonstrated that design innovation is both worth seeking and likely to be received.

RECOMMENDATION 12.3

Government clients should alter the timing of information provision in the tendering process for infrastructure projects so that non-design management plans are only required of the preferred tenderer. The obligation to produce documents upon becoming a preferred tenderer should remain a condition of the initial request for tender.

RECOMMENDATION 12.4

The 'early contractor involvement model' should be trialled by government clients to test the costs and benefits of applying past contract performance by tenderers as a means of constructor selection, consistent with the practices of some private sector clients.

RECOMMENDATION 12.5

For complex infrastructure projects, government clients should provide concept designs using Building Information Modelling (BIM) to help lower bid costs, and require tender designs to be submitted using BIM to reduce overall costs. To facilitate the consistent use of BIM by public sector procurers, Australian, State and Territory Governments should:

- ***facilitate the development of a common set of standards and protocols in close consultation with industry, including private sector bodies that undertake similar types of procurement***
- ***include in their procurement guidelines detailed advice to agencies on the efficient use of BIM.***

RECOMMENDATION 12.6

Within the request for tender, government clients should provide opportunities for tenderers to contest some key standards of the design where they have previously assessed scope exists for innovation to occur.

RECOMMENDATION 12.7

Australian, State and Territory Governments should remove the requirement for local content plans, such as the Australian Industry Participation plans, from tenders.

RECOMMENDATION 12.8

For larger and more complex projects, government clients should pre-test the market to gain insights into possible savings from packaging the project into smaller components, reducing the level of risk borne by any one contractor, and promoting greater competition from relatively smaller construction companies.

RECOMMENDATION 12.9

Government clients should invest more time and money in understanding the site risks for infrastructure projects and update the information provided to tenderers during the request for tender stage in consultation with potential contractors.

Costs have risen due to many reasons

FINDING 9.1

Aggregate data indicate that the costs of construction inputs, particularly labour, fuel and land, have risen substantially in recent years. While such data shed little light on design, environmental and many other cost elements, other evidence suggests that there have recently been periodic increases in these elements too. Most recently, labour market conditions appear to be softening significantly in some jurisdictions, which should reduce wage pressures.

Achieving better labour markets

FINDING 13.1

There is no robust evidence that the new industrial relations environment specific to construction had significant effects on the costs and productivity performance of the construction industry as a whole. There are likely to have been more important effects for the non-residential building segment of the industry, but any such effects would be hard to discover in the aggregate construction productivity data.

Regardless, for some segments of the industry and specific project sites, there remains evidence of unlawful conduct, overly generous enterprise bargaining arrangements, and other problematic industrial relations arrangements that are inimical to productivity and costs.

RECOMMENDATION 13.1

Australian, State and Territory Governments should adopt codes and guidelines with an essentially similar framework to the Victorian Code of Practice for the Building and Construction Industry for their own major infrastructure purchases.

The Australian Government should require compliance with these guidelines as a precondition for any infrastructure funds it provides to State and Territory Governments.

RECOMMENDATION 13.2

The Australian Government should:

- ***increase the ceiling of penalties for unlawful industrial relations conduct in the construction industry.***
- ***ensure that the specialist regulator has adequate resources to give genuine and timely effect to the enforcement regime.***

RECOMMENDATION 14.1

The Department of Industry should make and publish regular projections of labour demand from public infrastructure construction. Information collected and produced as part of the proposed benchmarking activities (recommendation 9.2) should support this activity, as should data held by Infrastructure Australia. The Department should also seek agreements with all private sector infrastructure providers and State and Territory Governments to provide data pertaining to their expectations of future need.

RECOMMENDATION 14.2

The Australian Government should request the Productivity Commission to conduct a public inquiry into Australia's apprenticeship arrangements. The inquiry should include, but not be limited to, an assessment of:

- ***the deficiencies of the current system, how these arise and who they affect***
- ***the role of the current apprenticeship system within the broader set of arrangements for skill formation***
- ***factors that affect the supply and demand for apprenticeships***

- ***the structure of awards for apprentices***
- ***potential reforms to improve the efficiency and effectiveness of Australia's apprenticeship arrangements.***

RECOMMENDATION 15.1

The current Review of the Australian Government Building and Construction OHS Accreditation Scheme should examine options such as 'recognition' and 'provisional accreditation', with a view to the implementation of measures to improve access to Commonwealth-funded projects for firms not presently operating in Australia.

FINDING 14.1

The Commission considers that overall, tradespeople, their clients and their employers have been poorly served by the lack of progress amongst governments in producing consistent occupational licensing across jurisdictions.

Better data collection and some improvements to Infrastructure Australia is required

FINDING 9.2

Comparisons of major project construction costs between Australia and other countries suffer from a range of methodological and data problems that limit their use. Recommended improvements in data availability, together with further development of reference frameworks, should assist greatly in reducing such limitations.

RECOMMENDATION 9.2

The Australian Government should fund the development and ongoing implementation of a detailed benchmarking framework for major infrastructure projects in Australia – in transport, electricity, water, gas and social infrastructure. This would substantially assist in the future planning and evaluation of projects, and is an essential factor in the much-cited pipeline of projects.

The benchmarking should include sufficient information of a strategic nature, including on costs per major unit, using a standard cost breakdown, and average expenditures over the construction period.

The provision of data to support the benchmarking framework should be a requirement attaching to all Australian Government funding for major infrastructure projects. The Australian Government should ensure data relating to its own projects are also captured. Mechanisms should also be developed to capture similar data from projects funded by other levels of government and consideration should be given to what information might be gathered from the private sector to enhance the quality of information provided by the benchmarking.

This ongoing benchmarking must be seen to be independent of both government and industry influence and also be seen as technically robust and credible. Infrastructure Australia should be responsible for packaging and publishing the benchmarking results, but should outsource the development and implementation of the benchmarking framework to agencies expert in the relevant areas, including the Bureau of Infrastructure, Transport and Regional Economics for transport projects.

RECOMMENDATION 7.2

The Australian Government should not proceed with those amendments to the Infrastructure Australia Act 2008 that restrict Infrastructure Australia from publishing information on project proposals it has evaluated, including cost–benefit analyses. The Board of Infrastructure Australia should have the power to limit the publication of information if, in its view, this would be likely to cause significant commercial harm to a government, individual or corporation. The Board should make it clear to project proponents and sponsoring governments that all information will be publicly disclosed except in these limited circumstances, and that it will not accept redactions in project proposals.

RECOMMENDATION 10.1

The Australian Bureau of Statistics should be funded to revise its approach to collecting productivity and other data within the construction sector. Separate collection and regular reporting of data for building construction and heavy and civil engineering construction would greatly improve the statistical information available to researchers and policymakers

Implementation of reform

RECOMMENDATION 16.1

Governments should commence implementing the recommendations outlined in this report that are relevant to their jurisdiction immediately. A formal Agreement across all jurisdictions is not a prerequisite for Australian, State and Territory and Local Governments pursuing most of the recommendations made by the Commission, as they relate to implementing best practice or improved processes within each jurisdiction.

RECOMMENDATION 16.2

The Australian Government should consider entering into formal bilateral agreements with State and Territory Governments that commit each jurisdiction to implementing a subset of the reforms (such as those identified by the Commission in table 16.2, or some combination of these recommendations).

The agreements should contain effective monitoring and public reporting arrangements, an agreed timetable for implementation, and a commitment to conduct an independent review of the reforms after a set time period.

1 Introduction

Key points

- This inquiry covers the provision, funding and financing of major public infrastructure, and the scope for reducing infrastructure costs. Although the emphasis is on economic infrastructure, major social infrastructure is also considered.
- Over recent years, the provision of infrastructure has become an increasingly important issue for governments, the community, private businesses and investors.
- Government decision making about public infrastructure is complex because of the long-lived nature of the assets, differences across the various types of infrastructure and the desire to address (and balance) efficiency, productivity and equity objectives.
- Efficient public infrastructure provides services that can improve productivity, community welfare and quality of life. But poorly chosen infrastructure projects can reduce productivity, adversely affect the environment, financially burden the community and crowd out more valuable projects.
- Governments are involved in public infrastructure to provide equitable access to services across the community and because there is a range of 'market failures' that could cause inadequate provision if they were not involved.
- In Australia, governments have historically taken responsibility for most aspects of infrastructure provision. But over recent decades there has been increasing recognition of the benefits that can come from greater private sector involvement.
- In recent years, there has been heightened interest in private sector funding and financing of infrastructure. This stems from: concerns about a perceived infrastructure deficit; antipathy to using government debt to finance infrastructure; the potential for efficiency gains in delivery in some circumstances; new opportunities for user charging; and macroeconomic objectives, such as offsetting falling investment in other sectors.
  - These issues need to be carefully evaluated to ensure that long-term benefits are not undermined in order to achieve perceived short-term outcomes.
- Outcomes from the provision of public infrastructure have been mixed, and important lessons can be learned to avoid repeating the mistakes of the past.
- The Commission seeks to identify practical improvements. The approach involves:
  - applying a transparent cost–benefit (or efficiency) framework
  - recognising the importance of project selection and risk allocation, and the role of cost–benefit analysis and institutional arrangements in achieving good outcomes
  - considering the full range of options for government and private involvement
  - looking for potential cost savings in the delivery of projects.

While concerns about the adequacy and cost of infrastructure have long featured in public discourse, infrastructure has become an increasingly significant issue for governments, the community, private businesses and investors over recent years. Reflecting this, there have been several major reviews prior to this inquiry, including by the COAG Reform Council (2012), Infrastructure Australia (2008d), and the Exports and Infrastructure Taskforce (2005). The Commission itself has undertaken several inquiries and studies into infrastructure sectors, particularly their economic regulation. There are several drivers of this interest, including a widespread view that Australia has an infrastructure deficit in areas like roads, rail and ports, and that this is holding back growth in productivity and affecting the amenity of our cities and regional areas.

This focus on public infrastructure and how community expectations about its provision can be met is not unique to Australia. In the United Kingdom, France, the United States, Canada and some other countries, significant effort and expense has been devoted to developing and applying models of service delivery that have the potential to improve the selection of infrastructure projects and the way they are delivered across a wide variety of sectors. There has also been interest in improving arrangements for public infrastructure from the G–20, the OECD, the World Bank and the International Monetary Fund.

An important lesson from this experience is that what works in one infrastructure sector does not necessarily work in another. This is because there are important differences between sectors that should influence arrangements for provision, funding, financing and achieving value for money in procurement. Accordingly, policymaking for public infrastructure — seen as simple in some public contributions to the debate — is actually complex.

This introductory chapter:

- outlines what the Commission has been asked to do (section 1.1)
- gives an overview of Australia's public infrastructure (section 1.2)
- discusses the role of government in infrastructure provision (section 1.3)
- explains the increasing role of the private sector (section 1.4)
- sets out the Commission's approach to the inquiry (section 1.5)
- documents the conduct of the inquiry (section 1.6)
- provides a guide to both volumes of the report (section 1.7).

1.1 What has the Commission been asked to do?

The inquiry terms of reference

The Australian Government has asked the Productivity Commission to undertake a broad-ranging inquiry into public infrastructure, comprising two broad streams of work:

- provision, funding, and financing of major public infrastructure
- the scope for reducing the costs of delivering such infrastructure.

The terms of reference ask the Commission to analyse:

- how infrastructure is currently funded and financed in Australia, including by the Commonwealth, the States and the private sector
- the rationale, role and objectives of alternative funding and financing mechanisms
- the financial risks to the Commonwealth posed by alternative funding and financing mechanisms, as well as their possible impact on the budget and fiscal consolidation goals
- the cost structure of major projects in Australia, including where infrastructure project costs have increased considerably compared with other countries
- ways to improve decision making and implementation processes to facilitate a reduction in the costs of public infrastructure projects
- other relevant policy measures, including any non-legislative approaches, which would help ensure effective delivery of infrastructure services over both the short and long term.

Scope of the inquiry

The OECD (2002) defines infrastructure as 'the system of public works in a country, state or region, including roads, utility lines and public buildings'. What is considered 'public' infrastructure is complicated, particularly given the way the relationship between the government and the private sector has changed over time. For the purposes of this inquiry, public infrastructure is considered to be all forms of infrastructure where governments have a substantial role in ensuring adequate provision because, if left entirely to private markets, there would be inadequate provision or no provision. A characteristic of infrastructure, like other major capital purchases, is that it has high upfront costs for construction and provides services to the community over many years.

The terms of reference require the Commission to consider public infrastructure projects within the category of 'economic infrastructure' (box 1.1). However, social infrastructure (such as hospitals, prisons and educational facilities) may have similarities to economic infrastructure in terms of planning arrangements, the decision to invest (driven by political decision-making processes), options for financing mechanisms, contracting arrangements, the potential for cost and time overruns, and the fact that it competes with economic infrastructure for government funding and financing.

Further, a number of participants argued for the inclusion of social infrastructure in this inquiry because of its important economic implications (Australian Property Institute, sub. 13; Mission Australia, sub. 14; NCOSS, sub. 20; Housing Industry Association, sub. 21; Industry Super Australia, sub. 60; Department of Infrastructure and Regional Development, sub. 64; Office of the Infrastructure Coordinator, sub. 78; Victorian Government, sub. 81). For these reasons, while the emphasis in this inquiry is on economic infrastructure, major social infrastructure is also considered.

Box 1.1 **Some infrastructure definitions**

- *Economic infrastructure* — incorporates the physical structures from which goods and associated services are used by individuals, households and industries, including rail, roads and public transport, water and energy networks, ports and airports.
- *Social infrastructure* — includes the facilities and equipment used to satisfy the community's education, health and community service needs, such as hospitals and schools (Chan et al. 2009).
- *Nationally significant infrastructure* — is defined by the *Infrastructure Australia Act 2008* (Cwlth) to include energy, transport, communications and water infrastructure in which investment or further investment will materially improve national productivity. In its recent consideration of Australia's key economic infrastructure, Infrastructure Australia (2013c) described nationally significant infrastructure as the structural elements of the economy that provide essential services to industry and households.
- *Major infrastructure projects* — definitions of 'major' or 'state significant' projects vary significantly between State and Territory Governments, and the Commission has previously noted (PC 2013d) the difficulty of defining what is 'major', as the impacts of a development can depend on the nature of the project (for example, its location, or the type of development).

The terms of reference also refer to the terms 'major infrastructure projects' and 'nationally significant economic infrastructure'. These are not defined in the terms of reference and can have different accepted meanings (box 1.1). What is 'major' or

'nationally significant' infrastructure is likely to vary between types of projects and jurisdictions (PC 2013d), and the Commission has not adopted a precise definition or threshold for nationally significant infrastructure for this inquiry. The Commission recognises that a number of small projects might be nationally significant when taken cumulatively. As an illustration, local councils may build roads that have small costs at the individual council level, but amount to billions of dollars when aggregated across a city or region.

The term 'provision' is used in this report to encompass the selection and delivery of infrastructure projects. In general, sound project selection requires that the community is provided with the infrastructure it is willing to pay for and that projects that do not meet this benchmark are rejected. Once selected, projects can be delivered in a variety of ways, for example, using a public private partnership (PPP), or a design and build contract. Efficient delivery requires that the most appropriate delivery model is chosen and that it is implemented in a way that avoids unnecessary costs.

The terms 'funding' and 'financing' are often conflated. For the purposes of this inquiry, funding refers to the revenue sources and streams used to pay for the costs of infrastructure over its life. Possible sources of funding are direct user charges (such as road tolls, port charges or volumetric water charges), value capture from charges on other beneficiaries, or general taxation. Financing refers to the supply of capital (private or public) used to pay for the upfront investment costs of an infrastructure project.

1.2 Australia's public infrastructure and its importance

Australia's public infrastructure

Like other advanced economies, Australia has a large and diverse stock of public infrastructure (box 1.2). In 2011-12, Australian governments owned 'infrastructure and other construction' assets valued at $614 billion (table 1.1). This category mainly comprises economic infrastructure, such as road, rail, energy and water assets. Governments owned a further $263 billion worth of buildings, much of which is social infrastructure, including schools and hospitals. These data exclude public infrastructure that is owned or leased long term by the private sector (including electricity and telecommunications assets, airports, ports, toll roads, schools and hospitals), which an indicative estimate suggests could have a value of about $260 billion (chapter 5).

In 2011-12, the output of Australia's major economic infrastructure sectors (defined as: transport, postal and warehousing; energy; information media and telecommunications; and water supply and waste services) accounted for 10 per cent of GDP (BITRE 2013a).

Box 1.2 **Examples of Australia's stock of infrastructure**

Economic infrastructure (as at 30 June 2011)

Transport assets

- 33 331 kilometres of railway track (includes passenger and freight lines, but excludes unused lines).
- 6 ports with more than 50 million tonnes throughput per year.
- Over 250 airports that handle over 142 million passenger movements per year.
- 911 419 kilometres of roads, including about 253 kilometres of tolled roads (which is 0.028 per cent of total roads).

Electricity assets

- 785 355 circuit kilometres of above-ground distribution network.
- 123 984 circuit kilometres of below-ground distribution network.
- 54 324 megawatts of generation capacity.

Water assets

- Almost $140 billion in water infrastructure assets.
- 157 741 kilometres of urban water mains.
- 127 165 kilometres of sewer mains.
- 55 218 kilometres of rural water network.

Communications assets

- Over $14.4 billion net capital stock in the information, media and telecommunications industry.

Social infrastructure

- 753 public hospitals (including 17 psychiatric hospitals) in 2011-12.
- 6697 government schools and 2730 non-government schools in 2012. The (written-down) value of the capital stock for all government schools was $70.6 billion in 2011-12.
- 113 correctional custodial facilities in Australia in 2013, of which 85 were government-operated prisons.

Sources: BITRE (2013a); PC (2014b).

Table 1.1 **Value of government-owned infrastructure, 2011-12[a]**

\$ billion

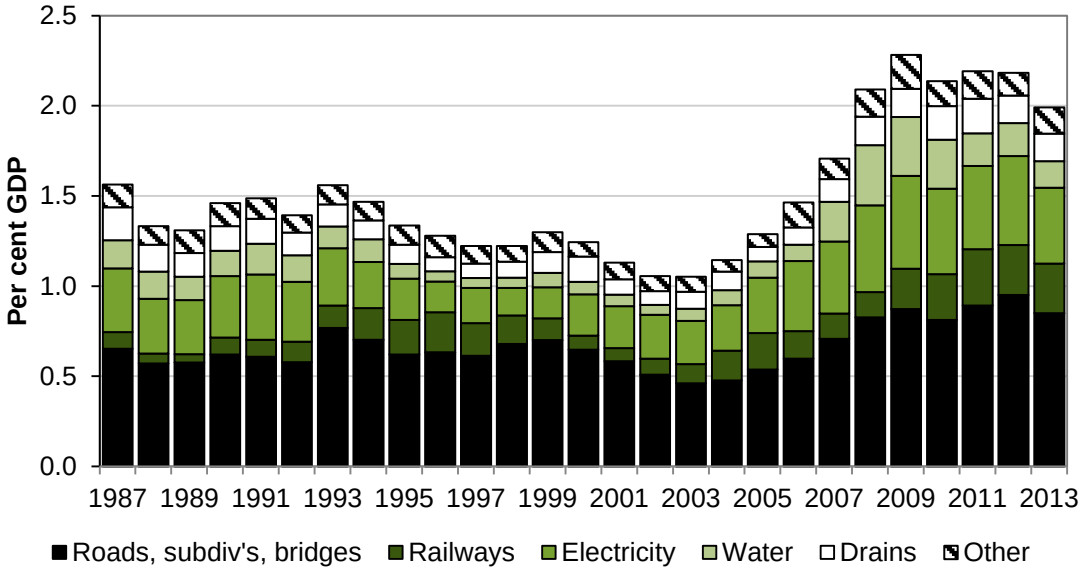
	General government	*GTEs and other*	*Total public sector*
Buildings	202	61	263
Infrastructure and other construction	394	220	614
Total	**596**	**281**	**877**

a Non-financial assets for all levels of government. GTEs = government trading enterprises.

Source: ABS unpublished (sourced from cat. no. 5514.0.55.001).

Engineering construction work for the public sector (a rough proxy for government investment in economic infrastructure) has increased over the last decade. Since 2008, it has been equivalent to 2 per cent of GDP or more, whereas in the 20 years prior to that it was mainly between 1 and 1.5 per cent of GDP (figure 1.1). In 2013, roads and related infrastructure accounted for about 43 per cent of the total (figure 1.1). In recent years, private sector investment in economic infrastructure has been around the same level as public sector investment (chapter 5). If there is an infrastructure deficit, these data indicate that it is not because of a fall in infrastructure investment.

Figure 1.1 **Expenditure on engineering construction work for the public sector, as a percentage of GDP[a]**



a Excludes the construction of buildings. Projects are classified as being for the public sector according to expected ownership at completion. This can cause projects undertaken as PPPs to be classified as being for the private sector, even though ownership eventually resides with the public sector. Telecommunications work for the public sector (which fell significantly in the mid-2000s due to the privatisation of Telstra, but increased more recently due to the roll out of the National Broadband Network) is not included. 'Other' includes: airports; harbours; pipelines; recreation facilities; oil, gas, coal and other minerals; and other heavy industry.

Source: ABS (2013a, 2014).

Responsibilities for public infrastructure

All levels of government are involved in providing public infrastructure, but the nature and extent of their responsibilities vary between jurisdictions and across different types of infrastructure (table 1.2). State and Territory Governments are responsible for most types of public infrastructure, with the Australian Government being responsible for ensuring the provision of particular types of infrastructure, such as aviation services and telecommunications. Local governments also play a role, particularly for local roads, wastewater services and various types of social infrastructure.

Table 1.2 **Responsibility for public infrastructure**

Level of government	*Commonwealth*	*State/Territory*	*Local*
Economic infrastructure			
Airports			
Local and regional			✓
Major	✓		
Aviation services	✓		
Dams		✓	
Electricity supply		✓	
Ports		✓	
Public transport		✓	✓
Railways (non-urban)	✓	✓	
Roads			
Urban		✓	✓
Rural		✓	✓
National	✓	✓	
Sewerage		✓	✓
Storm water management			✓
Telecommunications	✓		
Water supply		✓	
Social infrastructure			
Community centres			✓
Cultural facilities		✓	
Schools		✓	
Hospitals		✓	
Libraries		✓	✓
Residential aged care	✓		
Public housing		✓	
Public order and safety		✓	
Recreational facilities		✓	✓
Sport facilities		✓	✓
Tertiary education	✓		

Sources: Australian Airports Association (2012); PC (2011b); Webb (2008).

Even where governments are not responsible for providing infrastructure, they might still have a role in funding it. In particular, the Australian Government's role in funding public infrastructure extends beyond its constitutional responsibilities, and includes providing funding for roads, schools, hospitals and public housing.

The importance of public infrastructure

Infrastructure has an important social and economic role. The services provided by public infrastructure are inputs to firms and provide direct benefits to individuals. In a recent speech, Reserve Bank of Australia Deputy Governor Philip Lowe highlighted declining productivity growth in Australia, and the important role that efficient infrastructure investment can play in reversing this trend (Lowe 2013). Importantly, though, it is not just any infrastructure that can improve productivity growth — poor projects can detract from productivity and crowd out more efficient infrastructure provision. Spending money on infrastructure only builds productivity when it is the right infrastructure. The efficient use of existing infrastructure is also important.

The benefits of infrastructure vary across sectors. Transport networks facilitate production, allow businesses to access more customers (and vice versa), and improve the range of employment opportunities for workers (Lowe 2013). It can lower transport costs, deepen markets, and facilitate competition.

Electricity, gas and water transmission networks facilitate the efficient and reliable supply of electricity, gas and water to businesses and households.

Social infrastructure (such as schools and hospitals) provides important direct benefits to individuals and can also have broader economic implications. For example, improved education and health outcomes can lead to increased workforce participation and labour productivity.

Improved public infrastructure can also create benefits in related markets. For example:

- transport infrastructure that provides business with access to new port facilities can promote competition in stevedoring services and shipping
- communication networks increase the opportunity for collaboration and innovation
- ports and airports provide access to international markets and the benefits of international trade in goods and services

- rail systems built in the nineteenth and twentieth centuries established patterns of urban settlement on Australia's east coast that are highly valued today in the housing market
- urban roads, public transport and telecommunication networks can improve the amenity of cities and improve economies of agglomeration and contribute to innovation.

However, poorly chosen public infrastructure investment can also crowd out private investment, thereby reducing growth and productivity (Agénor and Moreno-Dodson 2006). Further, such infrastructure can harm the economy through the diversion of resources used in construction and maintenance to purposes not valued by users.

1.3 The role of government in infrastructure provision

For most types of economic activity, the role for governments does not extend beyond legal, policy and regulatory functions (box 1.3), as markets determine what is produced and consumed. Private sector firms compete in making investment decisions in response to market opportunities (as influenced by government policy settings and expectations). Customers create these opportunities through their willingness to pay for goods and services they value.

Even very large investments can occur in this way. An example is the $52 billion Gorgon project, which includes construction of a liquefied natural gas plant, a jetty for transport to international markets, and a separate gas plant and pipeline to supply the domestic market (PC 2013d). Additionally, the private sector has been willing to provide significant social infrastructure, such as private museums and private hospitals. It is important that governments recognise the role of the private sector in the provision of infrastructure and not discourage or crowd it out.

Public infrastructure is different from most other goods and services in the market. In many cases, governments have taken on the role of lead provider for equity reasons, because there is a market failure (such as monopoly characteristics), or sometimes for historical or cultural reasons. At times in a nation's development — for example, when markets or institutions are yet to reach maturity — government may be the only entity capable of taking on the risk of an infrastructure improvement sought by the community.

Equitable access has long been one of the main reasons why governments provide infrastructure, rather than the private sector. Markets may not provide equitable access to a basic quality of service (for example, in areas such as water, sewerage,

roads, rail and telecommunications) to groups that are less able to pay or are more costly to supply (such as rural communities).

Box 1.3 **Legal, policy and regulatory functions of governments**

Governments have an important role in creating a positive environment for investment, while protecting community values (including social and environmental amenity). Aspects of this include establishing:

- a legal framework that ensures property rights and contractual obligations are respected
- an industrial relations system that balances the interests of employers and employees and allows for flexibility at the workplace level
- education and training systems that are attuned to evolving skill requirements
- competition policies that prevent unnecessary barriers to entry for new firms (for example, for construction firms) and appropriately regulate market power
- land-use planning and zoning systems that resolve conflict about land use as early as possible in the planning to development chain
- environmental policies that are aligned with community preferences, achieve desired environmental outcomes at least cost and do not create unnecessary uncertainty for investment in long-lived assets
- development assessment and approval processes that are clear, certain and timely, while ensuring that environmental and other regulatory goals are achieved.

In addition, governments are involved in the provision of public infrastructure because there are market failures that would cause not enough of the good or service to be provided if left entirely to the market. There are three main sources of market failure particularly relevant to public infrastructure: natural monopolies, public goods, and externalities.

The existence of a natural monopoly is a source of market failure for many types of public infrastructure, including aspects of electricity, water and transport. It occurs where it is more efficient for one business to supply the entire market (or a segment of the market) than it would for two or more businesses to do so. For example, it would generally be inefficient to have two distributors of water, each with their own system of pipes running down every street. Conditions of natural monopoly create the potential for a firm to exercise its market power by setting prices higher, and the level of output lower, than would occur under a more competitive market. This leads to a reduction in net benefits to the community. However, natural monopolies can change over time. For example, new technologies and substitutes can reduce their extent and importance.

Public goods exist where provision for one person means the product is available to all people at no additional cost. Public goods are non-rivalrous (consumption by one person will not diminish consumption by others) and non-excludable (it is difficult to exclude anyone from benefiting from the good). If exclusion is technically impossible or economically too costly, the private market is likely to underprovide these goods or services. Roads have traditionally been seen as public goods, but the existence of toll roads shows that this need not always be the case — technology can lead to changes in the provision of services that have formerly been considered a public good.

Finally, externalities occur when the actions of an individual or firm create a benefit or a cost for others who are not a party to the transaction, and these impacts are not reflected in market prices. Markets tend to underproduce goods with positive externalities (such as education) and overproduce goods associated with negative externalities (such as goods whose production causes pollution).

Network externalities are of particular relevance to some public infrastructure. They are the effects on a user of a good or service of others using the same or compatible goods or services. For example, a greater number of users can make road networks more congested, lowering benefits to each user. The existence of network externalities can give rise to a need for coordination, which in some cases may be a function best performed by governments. For example, in making decisions on investment in public transport, governments can take into account any benefits that accrue to drivers of private vehicles as a result of there being fewer vehicles on the road.

The existence of market failure indicates a departure from an economically efficient ideal. Whether or not government involvement would be able to produce an overall improvement needs to be considered on a case-by-case basis, having regard to the severity of the market failure, and the costs and benefits of potential government actions. There is a range of ways that governments can respond to market failures, for example, they can choose to provide the infrastructure, or they can subsidise or regulate private provision. The merits of the various options should be considered.

1.4 The increasing role of the private sector

The terms of reference ask the Commission to examine ways to increase private financing and funding for public infrastructure projects. In assessing this, it is useful to examine the drivers behind private sector involvement in providing public infrastructure in the first place. In practice, a wide variety of delivery models have been used, which involve the private sector to varying degrees.

In part, greater private sector involvement has been enabled by technological changes that have allowed wider implementation of user charging models. Accompanying this has been the trend to consider private delivery of public infrastructure as a way to improve the timeliness, cost or early availability of new infrastructure, and more efficient operation of old infrastructure.

Types of private sector involvement

Private sector involvement in the delivery of public infrastructure can be undertaken in a variety of ways. For example, contracting models enable the government to develop the project and make the decision to proceed, but contract with one or more private firms for delivery of that project.

The traditional procurement model involves a government financing and owning the infrastructure, but contracting with private firms for its design, construction and maintenance. Alternatively, there are various types of PPPs. A PPP can be defined as a contract between the public and private sectors where a private party delivers infrastructure and associated services over the long term, and where some private financing is involved. In either case, funding can come from private sources (that is, user charges), tax revenue, or a combination of the two.

As more mature markets have evolved, governments have given further consideration to the possibility of using markets to support infrastructure provision. This can occur where user charges are sufficient to generate a commercial rate of return. For example, under regulated private provision, a government sets up a regulatory framework for the sector, and either sells former assets, or allows private parties to develop their own assets in order to provide a regulated service.

Privatisation of existing infrastructure assets has occurred in a number of sectors, both in Australia and internationally. In Australia, this includes the sale (or long-term leasing) of major (and some regional) airports, the Moomba-Sydney and some other gas pipelines, various electricity and port assets, and the national telecommunications carrier. More recently, the Australian Government has reverted to providing telecommunications infrastructure, by initiating the National Broadband Network.

As in many countries, Australia's experience with privatisation has been mixed. A key lesson is that the structure of the industry and relevant markets should be well defined prior to any privatisation, and the method chosen to privatise assets should be designed to maximise net benefits to the community. Practices designed to reach inflated sale prices are rarely successful, can disadvantage further efforts at privatisation and lead to an overall net cost to the community over the long term.

Above all, privatisation should be undertaken not for its own sake, but to achieve a more efficient outcome for the community at large.

There is at least some level of private sector involvement for most major public infrastructure projects. However, the extent to which the private sector is involved varies across jurisdictions, types of infrastructure, and over time, reflecting changing political and community preferences. For example:

- governments are generally responsible for funding, financing and owning most road infrastructure
- PPPs involving private financing have been used for some toll roads, railways, hospitals and water supply facilities in some jurisdictions
- privatisation has occurred for some electricity, airport and port assets, with some jurisdictions, such as Victoria, adopting this approach more than others.

Variations between sectors occur because public infrastructure is diverse in its attributes and because of various real or perceived social and political considerations.

Potential benefits

Private involvement in infrastructure can, in the right circumstances, improve timeliness, cost and availability of new infrastructure, as well as promoting the efficient operation of existing infrastructure, compared to public operation. For example, one of the potential benefits of private financing is that it can drive efficiency gains through the greater discipline and due diligence imposed by private financiers in the design, construction and operation of public infrastructure services (Engel, Fischer and Galetovic 2010; IFWG 2012).

Realising benefits from increased private sector involvement depends on being able to align the incentives of firms and individuals with the public interest. Given the varying prevalence of market failures across sectors, this is not always possible and so there should be no presumption that a higher level of private involvement is necessarily better. One important consideration is how to allocate the various types of risk to the entity best able to manage them, and in some cases this is likely to be a government. The best option varies depending on the project — it is a matter of ‘horses for courses’.

Renewed interest in private sector funding and financing

In recent years, there has been renewed interest in private sector funding and financing of public infrastructure projects. Based on consultations undertaken for this inquiry, the Commission has identified the main drivers of this interest as:

- a perceived infrastructure deficit
- government borrowing limits
- new opportunities for user charging
- macroeconomic factors.

The issues introduced here are taken up in more detail in later chapters.

The infrastructure 'deficit'

Underinvestment in infrastructure can have significant economic and social effects. For example, bottlenecks and congestion increase costs for businesses using the services delivered by infrastructure, directly reducing productivity growth. These bottlenecks, which can arise from population growth and intranational migration, are of particular concern in Sydney, Melbourne, Brisbane and Perth. Private involvement in public infrastructure has been perceived by some commentators as a way to overcome impediments (such as government budget and borrowing constraints — discussed below) which could be causing governments to underprovide public infrastructure.

Accompanying this are arguments that Australia has an infrastructure deficit — that is, there is a gap between Australia's current and required stock of infrastructure. Estimates of the size of this gap vary. For example, Infrastructure Australia estimated that the deficit was in the order of $300 billion (IA 2013a). Citigroup (2008) estimated that infrastructure investment required in the decade to 2018 would cost more than $770 billion. Many inquiry participants endorsed the notion that there was a substantial infrastructure deficit (including the Property Council of Australia, sub. 53; Australasian Railway Association, sub. 58; Industry Super Australia, sub. 60; The Australia Institute, sub. 85; and Master Builders Australia, sub. 88). However, there are a variety of views on what and where the main deficits are, with some participants pointing to roads, some to public transport (including rail) and others to different types of public infrastructure.

Although these arguments are evidence of substantial community interest in infrastructure, and its importance to productivity and the quality of life, they do not necessarily make the case that there is a deficit. While there are problems with

service standards falling due to usage being higher than capacity (for example, congested roads), additional investment is not always the best solution. It is often possible to improve utilisation of existing infrastructure — for example, by optimising the scheduling of rail services, or introducing congestion charging for roads in peak periods. A true infrastructure deficit would exist only where infrastructure was efficiently utilised and priced, and unmet demand remained.

Determining the level of infrastructure that most enhances welfare is a complex task. It is likely to be best approached by rigorous analysis of individual projects, rather than seeking to surmount an estimated deficit.

Government borrowing limits

Australian governments are subject to self-imposed debt limits, in part driven by their desire to achieve (or retain) a AAA credit rating. There are benefits to maintaining a AAA credit rating, such as the ability for governments to easily raise low-cost debt. However, there may be situations where public financing of infrastructure would be more efficient and welfare enhancing than either obtaining private financing, or not providing worthwhile infrastructure. In these circumstances, it is in the community's interest for governments to weigh up all considerations and not just focus on credit rating concerns.

Such tradeoffs need to be handled transparently, and the community needs to be provided with full information in order to assess the wisdom of different choices, as they will ultimately bear the cost of poor decisions.

New opportunities for user charging

Technological developments are making it increasingly cost effective to charge end users directly in areas such as roads. Charging can facilitate more efficient use of infrastructure, by aligning the price paid by users with the costs their use imposes. It also allows some of the public good characteristics of roads, such as the difficulty of excluding people unless they pay, to be diminished (in effect technology converts a public good to a club good or a private good).

Perhaps understandably, policymakers have been reluctant to adopt user charging in some areas, particularly road transport. There has been a long-standing expectation by the community that access will be free, under a model of service provision which sources funding from taxes and excises not directly related to usage. This is demonstrated by the very small proportion of public roads that are tolled.

Implementing effective user charging is challenging, both practically and politically.

It has been suggested that an important role of this inquiry is to communicate the value to users of more transparent and direct charges, which could replace current indirect charges (such as fuel excise). Better charging systems that enable greater consumer choice and greater communication of willingness to pay can be an important part of effective project selection, as well as potentially making it easier to secure private finance.

Macroeconomic factors

Some participants expressed the view that increased infrastructure investments could soften the blow from decreasing mining investment (Urban Development Institute of Australia, sub. 40; Cbus, sub. 67). They argued that investment in public infrastructure could provide macroeconomic stimulus (either nationally or regionally) to offset the macroeconomic consequences of the winding down of the mining boom, or contraction of sectors such as manufacturing. Similar macroeconomic outcomes can also be achieved through other forms of expenditure or taxation policy.

The decision to undertake infrastructure investment should be based on the expected net benefits from the investments. Substantial care should be taken not to undermine effective project assessment processes and risk management choices for short-term benefits. Infrastructure projects create long-lived assets and are not something that can readily be 'switched on or off'.

If it is the case that a macroeconomic need can be forecast sufficiently far in advance not to undermine the crucial design and assessment elements of infrastructure planning, then the two commitments may coincide. However, macroeconomic forecasting is usually not this precise. In many cases, it is likely that other macroeconomic policy levers will be more suitable for achieving the desired objectives. The emphasis for infrastructure should be on effective planning, consistent with the long-lived nature of the assets.

A related macroeconomic argument is that maintaining a high level of investment in public infrastructure is a way of promoting economic growth on an ongoing basis. However, such a strategy may not achieve its objective because:

- there tends to be diminishing returns from investment in mature infrastructure networks (OECD 2006)
- other (potentially more beneficial) investment may be crowded out.

In addition, while investment in infrastructure provides ongoing services that may increase the productivity of the firms that use those services, it can also create funding obligations over an extended period. Where project selection is poor, or costs escalate, the net effect can be a drag on growth and productivity in the long term. Again, the focus should be on effective long-term planning and the selection of public infrastructure projects that will provide net benefits to the community.

Mixed outcomes in public infrastructure delivery

In practice, outcomes from providing public infrastructure projects have been mixed. Governments in Australia have delivered effective public infrastructure over a long period. By and large, our cities and towns function adequately (or better) and assets are usually maintained sufficiently to avoid them failing. However, infrastructure costs have often been higher than necessary and risks not as well managed as they might have been. In addition, the history with 'icon projects' includes both failures and successes, with there often being a disproportionate emphasis on such projects at the expense of smaller, more tractable, projects.

Some examples that illustrate the mixed performance in selecting and delivering public infrastructure are as follows.

- Despite some concerns about the level of concessions provided by the Victorian Government to Transurban, the Melbourne CityLink project is generally considered to be a successful example of a privately financed toll road.
- The private party that financed the CLEM7 motorway in Brisbane went into receivership due to lower than expected patronage and toll revenue. The outcome was still arguably favourable for the broader community, which in the end acquired the motorway for much less than its actual cost. However, this project still consumed considerable resources that could have been put to better use. In addition, this and other private sector toll road failures likely contributed to an unwillingness by private parties to take on greenfields patronage risk in subsequent projects, thereby limiting future investment options.
- The SA Government opted to invest in a desalination plant, when it appears that an alternative that would have been much cheaper was available. The Australian Government's actions in insisting on a doubling of the plant's capacity as a condition of providing additional funding made matters worse. (Further information on these three examples is provided in appendix B.)

Some projects that were initially viewed by many as overly expensive, risky and possibly misguided have nevertheless achieved wide community support. Examples include the Sydney Opera House, the Snowy Mountains Scheme and C. Y.

O'Connor's water supply scheme to the Western Australian goldfields. However, this is not to say that 'visionary' projects always work out well, as evidenced by examples such as the Alice Springs to Darwin Railway (appendix B) and the Ord River Irrigation Scheme (Kelly 1978).

Governments are inevitably exposed to pressures to invest in infrastructure projects that may not be in the long-term interests of the community but are beneficial to a particular group. These pressures arise because governments, armed with taxing powers, are generally less constrained than firms in incurring costs, and are interested in seeking popular support. This can offset any in-principle desire to invest efficiently. Also, sometimes governments (and oppositions) announce projects along with a hastily estimated costing, particularly in the lead up to an election, which can lead to poor project selection.

Mixed outcomes arise because of these pressures, and because decisions about public infrastructure provision are complex. There are differences between sectors in terms of identifying projects, the processes for assessing their worth, the practices of determining who pays for them and how directly the impact of payment is felt, and the consequent level of knowledge within the community about the true cost of services.

1.5 The Commission's approach

The Commission's approach in this inquiry was to identify practical improvements that can be made to the provision, funding, financing and cost of public infrastructure. Other key aspects of the Commission's approach are as follows.

Applying a transparent cost–benefit (or efficiency) framework

Users of infrastructure, financial institutions and the broader community have different perspectives on what makes for successful infrastructure projects. The concept of economic efficiency provides a way to integrate all of these perspectives and guide decisions towards those that improve overall outcomes for the community. As stated in the inquiry's terms of reference, efficient public infrastructure plays a key role in a competitive and productive economy. Economic efficiency has a number of different aspects, as explained in box 1.4.

Box 1.4 **Economic efficiency and value for money**

Economic efficiency

Economic efficiency is about maximising the collective wellbeing of the members of the community, including in the provision and utilisation of public infrastructure. It has three components, as follows.

- Productive efficiency is achieved when delivery of infrastructure services is at the lowest possible cost. An example of an improvement in productive efficiency is where improved work practices lead to less labour being required to build a road.
- Allocative efficiency is about achieving the highest possible net benefits to the community from the provision of public infrastructure in aggregate. For example, if there are two infrastructure project proposals that would be equally costly to build, prioritising the one that would produce the greatest benefits would improve allocative efficiency.
- Dynamic efficiency refers to the improvement of productive and allocative efficiency over time. For example, infrastructure procurement processes that encourage innovation can lead to new technologies and design solutions that are then available for future projects, and this improves dynamic efficiency.

Value for money

In general, achieving greater economic efficiency in infrastructure delivery also improves value for money. However, governments, in their role as purchaser of infrastructure-related services, have a distinct interest in value for money (in other words, achieving the best deal they can on behalf of the community). For example, procurement practices that engender competition can improve efficiency by pushing firms to find cost savings or quality improvements but, in addition, may cause firms to trim the return they would expect to get, and this can improve value for money even further.

Insights into the economic efficiency of proposed public infrastructure projects can be gained by conducting thorough and transparent cost–benefit analysis. This sometimes needs to incorporate real options analysis to properly factor in uncertainty. Where a cost–benefit analysis shows a project has a positive net benefit, this suggests that proceeding with it will improve economic efficiency. However, it is necessary to consider whether there are alternative projects that would improve efficiency to a greater extent, or achieve particular benefits at a lower cost.

Accordingly, the Commission has applied a cost–benefit (or efficiency) framework in analysing issues in this inquiry. In applying this framework, the Commission has also given consideration to equity objectives, value for money, fiscal constraints, and the environmental and amenity impacts associated with the construction and operation of infrastructure.

Recognising the importance of project selection

Although underprovision of infrastructure can have detrimental effects on the community, so too can providing infrastructure that is too large, poorly matched to the needs of the community, or unnecessary given opportunities to improve the utilisation of existing infrastructure. Proceeding with major infrastructure projects entails large resource costs that are only worth incurring if they are outweighed by the benefits of the services that they provide. Accordingly, the selection of projects is as important, if not more important, than the funding and financing arrangements used to deliver them. There are examples of public infrastructure projects that have proved to be poor investments — imposing net costs on the community. Worthwhile projects to upgrade infrastructure over time have also sometimes been overlooked, leading to inadequate service standards which can then only be rectified at great expense.

Because of this, the Commission has paid considerable attention to project selection, including the importance of cost–benefit analysis, and the role of institutional arrangements that give rise to decisions to provide public infrastructure. This is consistent with the approach advocated by a number of inquiry participants (Department of Infrastructure and Regional Development, sub. 64; Office of the Infrastructure Coordinator, sub. 78). For example, the Office of the Infrastructure Coordinator argued that:

> Infrastructure funding and financing cannot be reviewed in isolation from broader institutional reforms that are needed to enhance decision-making processes for infrastructure investment. With this in mind, the Office recommends that the Commission adopt a comprehensive approach to investigating reforms that takes into account the need to get the policy settings for long-term national planning and prioritisation of infrastructure projects right, in addition to resolving the issues around the funding and financing of those projects. (sub. 78, p. 1)

Considering the full range of options for government involvement

Due to the equity objectives and market failures discussed above, governments historically played a dominant role in the provision, funding and financing of public infrastructure. However, the benefits of private sector involvement have been increasingly recognised over the last several decades. In some cases, new opportunities for such involvement have arisen because markets have matured, private sector capabilities have expanded and innovative ways to address market failures have been developed. The benefits can include greater incentives to reduce costs, better risk management and innovation in project design and delivery.

As discussed earlier, there is a range of different approaches that can be used to facilitate private sector involvement. The Commission's approach has been to consider the full range of options. In line with the terms of reference, particular attention was given to options for greater private sector financing and funding, and how to overcome barriers to their use.

In addition, the roles of the three levels of government were considered, as the interaction between levels of government can have important consequences. This is particularly the case, given that the Australian Government raises a disproportionately large share of tax revenues, while State and Territory Governments are responsible for most types of public infrastructure.

Looking for cost savings in setting policy and implementing projects

As discussed, there is a range of policy and regulatory areas that are important in creating a positive environment for investment in the economy generally (box 1.3). Although it was beyond the scope of this inquiry to consider all of these areas in detail, aspects of them were examined in order to address the cost side of the terms of reference — for example, issues relating to competition, industrial relations and skills. Some other areas, such as development assessment and approval processes for major projects, and the economic regulation of a number of infrastructure sectors, have been dealt with in recent Commission reports (PC 2011a, 2012c, 2013c, 2013d).

The Commission has also examined opportunities for reducing costs through better project implementation. This includes examining ways in which governments can streamline bidding processes and contract more effectively with private firms. This has the potential to create stronger incentives for cost minimisation, innovation, on-time delivery and management of whole-of-life costs. A further area of potential cost savings that was explored is the identification and protection of land that is likely to be required for future infrastructure development.

1.6 Conduct of the inquiry

The terms of reference for this inquiry were received from the Treasurer on 13 November 2013.

During the course of this inquiry, the Commission consulted and invited participation from interested parties in a variety of ways. At the commencement of the inquiry, a circular was forwarded to people and organisations that the Commission thought might be interested in participating in the inquiry. The inquiry

was also advertised in national newspapers and promoted on the Commission's website.

An issues paper was released on 28 November 2013 to assist interested parties in preparing submissions to the inquiry. A draft report was released on 13 March 2014, and comment sought, including on draft recommendations.

The Commission met with a wide range of stakeholders, held a roundtable in Melbourne, and public hearings in Melbourne, Brisbane and Sydney.

A total of 110 submissions were received in response to the issues paper and a further 104 submissions in response to the draft report. Appendix A provides details of the individuals and organisations that participated in the inquiry.

The Commission thanks all inquiry participants for meeting with Commissioners and staff, participating in roundtables and hearings, and making submissions to the inquiry.

1.7 Guide to the report

This report comprises two volumes.

Volume 1

The remainder of volume 1 covers provision, funding and financing. Chapter 2 details the institutional arrangements in which project selection decisions are made, the factors that influence those decisions and some improvements that could be made. Chapter 3 outlines broad principles relevant to deciding on the level of private sector involvement in the delivery of public infrastructure. Broad principles for choosing between various funding mechanisms, and impediments to the adoption of different funding models, are presented in chapter 4. Methods of financing infrastructure and the issues associated with them are discussed in chapter 5. An examination of the efficiency of different financing mechanisms, and barriers to private sector financing is undertaken in chapter 6. The scope for institutional and governance reform to improve outcomes in the provision of public infrastructure is examined in chapter 7. Chapter 7 also addresses coordination between governments and proposes an approach to encourage the adoption of best practice governance arrangements at all levels of government. Chapter 8 proposes reforms to the governance and institutional arrangements for the funding and provision of roads.

Volume 2

Volume 2 considers the scope for reducing the cost of public infrastructure. Chapter 9 examines construction costs, including their composition, levels, trends and comparisons with other countries. Measures of the productivity of the infrastructure construction industry and the use of benchmarking to evaluate productivity are assessed in chapter 10. How concentration in the market for large infrastructure projects may affect competition, input costs and tender prices is covered in chapter 11. Chapter 12 examines the impacts of different tendering and contracting arrangements on cost and time overruns, as well as on the quality of projects. The influence of industrial relations arrangements on productivity, costs, and the conduct of unions and contractors is covered in chapter 13. Chapter 14 examines the effect of skills shortages on construction costs, and governmental policy initiatives to address them. Chapter 15 explores planning and regulatory impediments to the efficient construction of public infrastructure.

Chapter 16 summarises the recommendations from all the previous chapters and outlines a suggested approach for implementing the reform package.

The chapters are supported by a series of appendices that provide case studies and further detail on some issues.

2 Project selection

Key points

- Selecting the right projects is the most important aspect of achieving good outcomes for the community from public infrastructure.
- There are many examples in Australia of poor project selection leading to highly inefficient outcomes. In such cases, investment in public infrastructure is a drain on the economy and tends to lower productivity and crowd out more efficient projects.
- The institutional arrangements within which project proposals are analysed and decided upon are vital. Reforming these arrangements can help to avoid the types of project selection problems that have occurred in the past.
- Institutional arrangements that involve governments selecting projects can result in decisions being based on inaccurate information, or becoming politicised. Often, the incentives for efficiency are weak and short-term considerations can dominate decision making. This can result in poor projects being selected and good projects being ignored or stymied by regulatory and other barriers.
- In recent decades, some public infrastructure businesses have been privatised, with private entities then making decisions about new projects. Whether this leads to more efficient project selection (and other efficiencies) depends on policy and regulatory frameworks. There are examples where privatisation has worked well.
- It is in the public interest to privatise some further public infrastructure businesses, including in the energy and ports sectors, where effective reform models have been in operation in some jurisdictions for many years.
- Privatisation can remove the need for governments to have an ongoing role in selecting projects.
- Some public infrastructure businesses have been corporatised. This can lead to more efficient project selection, but the incentives for efficiency are not as strong as for private firms.
- Where user charging is not practical or desirable, privatisation or corporatisation is unlikely to be feasible and there is likely to be a continuing need for government provision.
- In these cases, it is important that institutional and governance arrangements promote efficiency to the greatest extent possible.
- When properly conducted, cost–benefit analysis is a useful tool for guiding project selection and improving the transparency and quality of decision making.
- Governments should commit to subjecting public infrastructure proposals to rigorous cost–benefit analyses that are publicly released. This commitment should extend to projects announced prior to elections.

Project selection is crucial to the overall efficiency of public infrastructure. If the wrong projects are selected the outcome for the community will be poor, even if these projects are efficiently funded and financed, and their costs well controlled.

This chapter discusses the importance of project selection (section 2.1), before focusing on two areas that are vital for achieving efficient outcomes. First, the institutional arrangements that give rise to the selection of projects (section 2.2). That is, who makes the decision that an infrastructure project should proceed and the policy, regulatory and governance environment in which these decisions are made. Second, the role that cost–benefit analysis can play in improving project selection and making decisions more transparent (section 2.3).

2.1 The importance of project selection

Ideally, project selection for public infrastructure should be initially undertaken before consideration is given to funding, financing and other aspects of project delivery. Project selection encompasses a range of decisions, including:

- that a major investment in infrastructure should proceed (for example, that a large addition to the water supply infrastructure for a city is needed)
- about the type of infrastructure to provide (for example, whether the supply source should be a seawater desalination plant, water recycling facility or dam)
- about key project features, such as location, size and service quality standards (for example, the location, capacity and water quality standards for a desalination plant).

These decisions may be made at an initial stage and then varied in response to new information. For example, a project might be modified or abandoned before the final decision to proceed if further analysis shows that costs are likely to be much higher than originally estimated. Accordingly, project selection should be understood as a process that commences with initial planning and continues through to the point where contracts for project delivery are signed.

Best practice project selection can greatly reduce, but not eliminate, the number of projects that prove to be poor investments. This is because perfect foresight is unachievable and so decisions must always be made based on imperfect information about how the future will play out. In addition, some investments may perform poorly not because of inadequate project selection, but because of deficient implementation.

There is considerable international and Australian evidence to demonstrate the importance of project selection, and the high costs to the community from deficient choices. A noteworthy international example is Spain's Ciudad Real airport, which was opened in 2008 at a cost of €1.1 billion and closed in 2012 after only four years of operation (BBC News 2012). The importance of project selection and the need to improve it was emphasised by a number of inquiry participants (box 2.1).

Box 2.1 **Participants stressed the importance of project selection**

Consult Australia argued:

> A long-term approach to the prioritisation of infrastructure is essential. While many infrastructure projects are prioritised through clear and rational assessment, in some cases decision making risks being misconstrued, and may appear to be driven by political exigency where no clear process or guidelines for assessment have been developed. (sub. 23, p. 4)

Engineers Australia argued that project selection was sometimes based on political expediency:

> Public infrastructure is critical to Australia's future, but present infrastructure planning, development and implementation arrangements are sub-optimal and there are too many decisions not based on objective criteria but on political expediency. (sub. DR123, p. 1)

The Transport Reform Network stressed the importance of integration with land-use planning:

> Decisions about land use and transport must go hand-in-hand. We are getting better at this, but much still needs to be done to improve the integration of land use and infrastructure planning and delivery. (sub. 54, attach. A, p. 5)

In discussing roads and rail infrastructure, Ergas said:

> The incentives in political decision-making lead to an undue emphasis on 'ribbon cutting' opportunities, generally associated with very major ('mega') projects, at the expense of periodic maintenance and of small-scale 'de-bottlenecking' options that could postpone or even avoid the need for costly asset expansions. (sub. 87, p. 13)

The Australian Industry Group emphasised the importance of cost–benefit analysis in selecting projects:

> … project selection should be based on thorough cost benefit analysis. Bodies like Infrastructure Australia have made significant progress towards ensuring this occurs, but further progress needs to be made on project selection especially by state governments. (sub. 47, p. 4)

The Australian Automobile Association also stressed the importance of project selection processes:

> Rigorous project selection processes which include peer reviewed economic and transport modelling should be adhered to. (sub. 65, p. 10)

Where project selection is deficient, the consequences can be that the community incurs billions of dollars in unnecessary costs. For example, a recent Commission

inquiry found evidence of inefficient investment in augmenting water supplies in most of Australia's largest cities. Not all of the unnecessary costs associated with this were able to be estimated, but those that were amounted to over $3 billion. The Commission argued that:

> Although some of the recent investment in desalination plants … might have been appropriate in the circumstances to maintain security of supply, there is sufficient evidence available to conclude that many projects could have been:
>
> - deferred for a number of years
> - smaller in scale
> - replaced with investment in lower-cost sources of water. (PC 2011a, p. XXIII)

The causes of poor project selection are many and varied. In the case of urban water, unclear roles and responsibilities, policy prohibitions on specific supply options, deficiencies in analysis of options and grants/subsidies provided by governments were involved (PC 2011a).

In the case of electricity networks, a recent Commission inquiry found that regulated reliability standards were mostly too high, and that this required network businesses (whether public or privately owned) to make unwarranted investments that imposed high costs on consumers. Indicative estimates suggested that:

> … adopting a different reliability framework for the transmission network could generate large efficiency gains in the order of $2.2 billion to $3.8 billion over 30 years (PC 2013c, p. 2)

The case studies in appendix B provide evidence that the selection of transport projects is sometimes deficient due to inadequate planning, and inaccurate demand and cost forecasts. For example, a cost–benefit analysis conducted for the CLEM7 Tunnel freeway project in Brisbane showed a net present value of $638 million and a benefit–cost ratio of 1.52. However, this analysis proved to be highly inaccurate, with the actual capital cost being 2.5 times higher and patronage nearly three times lower than forecast. More accurate forecasts would have shown the project to comprehensively fail a cost–benefit test.

The consequences of poor project selection in this case fell mainly on the private consortium that took on patronage risk, rather than on the community in general. However, CLEM7 still represents an inefficient investment that may have been avoided had a more rigorous cost–benefit analysis been conducted and made public. Given the recent trend away from assigning patronage risk to the private sector, such failures would be likely to impact more directly on the community in future.

High costs can also be imposed on the community through the failure to proceed with worthwhile projects to incrementally upgrade existing infrastructure networks.

Water security is an example. Over time, the failure to adequately maintain and upgrade infrastructure can lead to crisis situations that can only be resolved through very large (and often disruptive) infrastructure investments.

There are also examples where large public infrastructure projects have been approved without any formal analysis of their costs and benefits. Most notably, the National Broadband Network, Australia's largest public infrastructure project, was commenced without a cost–benefit analysis having been done. It also appears that detailed analysis of the project was focused, from a relatively early stage, on how best to implement the government's policy objectives, rather than considering the merits of different options (box 2.2).

Finally, work by the WA Auditor General shows that there is sometimes a failure to reassess project selection decisions as their scope changes and better information becomes available about their costs. He found that actual costs for a sample of 20 major projects in Western Australia (including hospital, school and prison projects) were 114 per cent higher than the original approved budgets (Office of the Auditor General Western Australia 2012). Ninety per cent of the variance in project budgets occurred during the evaluation phase of projects, when the project business case was developed and project scope and costs were more accurately defined. The Auditor General found that there 'was often a lack of evidence to show that the existing business case remained valid following changes in the project scope' (Office of the Auditor General Western Australia 2012, p. 9).

2.2 Institutional arrangements

There are various types of institutional arrangements that can be used for project selection for public infrastructure. For each, there is an entity that decides which projects should proceed and a set of institutional and governance arrangements that can influence these decisions.

Government

Institutional arrangements that have an arm of government as the entity that selects projects vary in their makeup. In general, they involve a government department or agency that undertakes planning, considers a range of options, develops and assesses project proposals, and provides advice on these to the relevant Minister(s). (Appendix F provides further information on infrastructure planning.)

Box 2.2 **Genesis of the National Broadband Network project**

In May 2007, the federal opposition committed to investing in a national broadband network if elected. Following the election later that year, the new Australian Government issued a request for private sector proposals to build and operate a broadband network. Several proposals were received, but on advice from a panel of experts that none of them offered value for money, this process was terminated (Rudd 2009). This occurred concurrent with the onset of the global financial crisis which, the panel reported, had a significant impact on the process.

In April 2009, the Prime Minister announced that the Australian Government would 'build and operate a new super-fast National Broadband Network [NBN]' (Rudd 2009). The Prime Minister said that the new network would connect up to 90 per cent of Australian homes, schools and workplaces with broadband using fibre to the premises (bypassing the existing copper network owned by Telstra), with the remaining 10 per cent of premises being provided with next generation wireless and satellite services.

The Australian Government estimated that the project would cost up to $43 billion over eight years. It said that the NBN would be built and operated by a new company established for this purpose, with majority Government ownership. The company would be permitted to offer wholesale services only, thereby delivering separation between the infrastructure provider and retail service providers.

The Department of Broadband, Communications and the Digital Economy later stated:

> Faced with a significant failure in the telecommunications marketplace with significant long term structural implications for its operation and the wider economy, the lack of an acceptable private sector alternative and private sector difficulty in raising capital because of the 2008-09 global financial crisis, the government decided that it would need to take the leading role in providing a solution. (quoted in AGCNCO 2011, p. 7).

Rather than conduct a cost–benefit analysis of the project, the Government commissioned an Implementation Study (released in May 2010), which was a detailed examination of the NBN project. The study was concerned with how best to implement the Government's stated policy objectives, but did not evaluate those objectives. The study explicitly stated that it did not:

- evaluate the decision to implement the NBN via the establishment of NBN Co
- undertake a cost–benefit analysis of the macroeconomic and social benefits that would result from the implementation of a superfast broadband network. (McKinsey & Company and KPMG 2010, pp. 1–2)

More recently, the Australian Government commissioned a strategic review of the NBN in 2013. This review (which was not a cost–benefit analysis) found that construction of the network was substantially behind schedule and estimated that, under the existing plan, the peak funding requirement would be $73 billion. The Minister for Communications, Hon. Malcolm Turnbull MP, has announced that a cost–benefit analysis of the economic and social returns from broadband will be undertaken (Turnbull 2013).

Ministers may also put forward project proposals for development by their departments. Ministers decide which projects should be put forward for consideration by Cabinet, which then decides on whether they should proceed. In some cases, there is also an agency that reviews infrastructure project proposals developed by departments across a range of portfolio areas (for example, Infrastructure NSW).

In Australia, multiple levels of government are often involved in these arrangements. For example, a state or territory government's decision to proceed with a project may be conditional on receiving a Commonwealth grant. Accordingly, the Australian Government's assessment and prioritisation of a state-based project may determine whether or not it is built. Infrastructure Australia plays a role in advising the Australian Government on some of these matters. Local governments also develop infrastructure project proposals that require financial support from higher levels of government to proceed.

Institutional arrangements that include governments as the 'project selector' are the norm for roads, passenger rail networks, public transport, and most social infrastructure (including schools, hospitals and prisons). Governments sometimes also select projects in sectors where government trading enterprises are responsible for delivering services using the infrastructure. For example, governments have made decisions about major water supply augmentations in some jurisdictions in recent years (PC 2011a). There are also instances where governments have selected projects in sectors where investment has previously (at least in recent times) been a matter for the private sector — the National Broadband Network being the most prominent example.

When governments select projects they can, at least in principle, weigh up costs and benefits from a community-wide perspective (using cost–benefit analysis). This means that benefits that are not captured by direct user charges (for example, reduced travel times from a non-tolled road) can be taken into account. However there are a range of potential shortcomings from such arrangements, including:

- inadequate incentives and accountabilities for ensuring that projects are properly analysed
- decision makers having difficulties in judging whether analyses accurately represent the likely costs and benefits of projects
- budget processes that consider capital and operational expenditure separately, leading to a lack of incentives for developing project proposals that optimise whole-of-life costs (Evans & Peck, sub. DR175)

- decisions being driven by political considerations rather than by economic merit, particularly in the lead up to elections
- decisions being based on inadequate analysis due to a perceived need for governments to react quickly to infrastructure problems that receive media attention or provide stimulus to the economy during a downturn
- preference being given to large iconic projects, rather than projects which are less attention grabbing, but which might offer higher net benefits
- incentives for a preferred project to be selected at an early stage and maintained even if new information shows it to be deficient.

The incentives referred to in the latter point could arise, for example, because a government sees an advantage in announcing a project to address a recognised problem, and is then reluctant to alter or abandon it as this could be regarded as breaking a promise. A government might also take steps to 'lock-in' a decision to prevent successor governments from altering or abandoning a project.

Not all institutional and governance arrangements that have governments as the selector of projects are equally prone to these potential problems. For example, arrangements that require cost–benefit analyses to be independently scrutinised and made public may be able to improve incentives and accountabilities, as discussed later in this section.

Private sector

Over the last three decades some public infrastructure has been privatised, including in areas such as electricity, gas, telecommunications, airports and ports. Where this has occurred, it is often the privatised firms that make decisions about investing in infrastructure expansions. For example, a firm that owns an airport may decide to invest in a new runway so as to increase capacity (and revenue).

Firms have strong incentives to select and invest in the projects that will be most profitable for them, and additional scrutiny is provided by their financiers. Further, firms that are successful in acquiring formerly publicly-owned assets will tend to be those that consider that they can extract the most value from operating and further expanding them, including by developing innovative services for which customers are willing to pay. Firms can also be expected to closely examine the relative merits of investing in new assets and pursuing opportunities to operate existing assets more efficiently (box 2.3). This can boost the sale price achieved from privatisation and improve the efficiency of future investment.

Box 2.3 Operating existing assets efficiently can reduce the need for new investment

Low service standards from public infrastructure can take a variety of forms, often involving queuing or rationing. For example, traffic on roads can become congested, freight ships may need to wait before being able to load or unload, and interruptions to electricity supplies may occur during periods of high demand. Inadequate infrastructure services may also cause some firms that rely on those services to shelve plans to expand and/or move into exports.

Investing in new infrastructure might alleviate such problems, but frequently more efficient operation of existing assets can provide a less costly solution. In addition, consideration needs to be given to whether the benefits of addressing a perceived problem outweigh the costs (for example, incurring the costs of occasional electricity outages may be preferable to incurring the high costs needed for 'failsafe' supply). Some aspects of efficient operation are described below.

Improving the efficiency with which infrastructure is used can reduce or delay the need for new investment. For example, National ICT Australia (sub. DR121) reported that their analysis has demonstrated that a potential rail track upgrade at Port Botany estimated to cost up to $200 million could be delayed by 15 to 20 years through applying a new optimised freight movement schedule.

Adopting more cost-reflective pricing and other demand management practices can lower peaks in demand, lessening the need to invest. For example, peak demand growth has been a key driver of investment in electricity generation and network capacity in recent years due to inadequate pricing. The Commission has previously recommended time-based pricing and other reforms that would defer costly investment and ease overall price pressures on customers (PC 2013c).

Timely maintenance of infrastructure can extend its useful life. Engineers Australia (sub. 26, p. 1) reported that currently in Australia 'basic matters like maintenance are routinely neglected leading to higher than necessary costs and demands for additional infrastructure ahead of optimal requirements'. Local Government Infrastructure Services (sub. DR155) reported that there were many cases where councils neglected basic maintenance, leading to costs that were higher than necessary.

Some commentators have argued that the public sector often does not fully exploit opportunities to operate existing infrastructure more efficiently and/or that significant efficiency improvements have occurred following privatisation. For example, in commenting on infrastructure productivity internationally, McKinsey & Company argued:

> A bias among public officials to build new capacity, rather than make the most of existing infrastructure, is common, leading to more expensive and less sustainable infrastructure solutions. (2013, p. 5)

An additional issue is that poorly designed, or unnecessary government regulations can impede the efficient use of existing infrastructure, whether publicly or privately owned (chapter 15).

Private sector investment is generally based on an analysis of the expected commercial benefits that will accrue to the firm concerned. Due to the existence of market failures and equity issues, such investment decisions may not align with what is in the public interest. As expressed by Edwards, 'modern corporations do not necessarily or inherently work for the public interest' (sub. DR181, p. 6). However, governments attempt to improve this alignment through policy and regulatory arrangements that influence (or dictate) investment (and other) decisions. For example:

- policies may create incentives to invest in one type of infrastructure rather than another so as to achieve environmental and other policy objectives (for example, the Australian Government's Renewable Energy Target creates financial incentives for investment in renewable energy sources)
- regulated service standards may require new investments to be made (for example, electricity network upgrades to ensure that regulated reliability standards are maintained)
- regulators sometimes have limited powers to direct firms to invest in an infrastructure upgrade that they consider is needed to meet mandatory service standards (PC 2013c)
- regulatory price setting can entail firms only being able to recover costs for investments that the regulator regards as being efficient, and so the regulator's view can influence which investments are made
- third-party access regulations can influence investment decisions, particularly for greenfields infrastructure or major capacity expansions of existing infrastructure, by constraining the prices investors can expect to get for the services they provide.

The way that policy and regulation influences investment decisions is crucial. They can have the desired effect of improving outcomes for the community, or they can make things worse. For example, Ergas argued that deficiencies in telecommunications regulation worked against private sector investment in broadband:

> It is … arguable that the de facto renationalization of the telecommunications network could have been avoided had the then regulatory framework provided clearer, more predictable and credible incentives for private sector investment in high speed broadband. (sub. 87, p. 11)

Accordingly, the merits of institutional arrangements that leave infrastructure project selection to the private sector depend crucially on how regulatory arrangements operate in practice. Information asymmetry, whereby the regulated firm has better knowledge than the regulator, and 'gaming' of regulatory pricing

models are not uncommon. Overall, infrastructure regulation is a complex area and the merits of particular approaches often depend on the characteristics of individual sectors.

In recent years, the Commission has examined and made recommendations to improve the regulation of several infrastructure sectors, including electricity networks (PC 2013c), urban water (PC 2011a) and airport services (PC 2012c). Other inquiries have investigated regulatory regimes that apply across a range of sectors, such as the National Access Regime (PC 2014a). Some broad conclusions that can be drawn from this work are that:

- where possible, regulatory approaches should seek to maintain strong incentives for firms to minimise costs and to innovate, while limiting their ability to exercise market power (so-called 'incentive regulation')
- regulation needs to be tailored to the extent of market failures and other characteristics of individual sectors (for example, adopting 'light-handed' regulation in sectors where competition from substitute services and other factors constrain the exercise of market power)
- over the longer term, regulation that causes firms to be under-compensated are likely to have greater costs for customers than an equivalent degree of over-compensation (due to the chilling effects on investment in new infrastructure)
- it is important to get structural arrangements and regulation right prior to privatisation (for example, separating natural monopoly components (such as electricity networks) from potentially competitive components (such as electricity generation)).

On the latter point, structural separation can bring benefits because it can make it easier to achieve effective competition in those components where competition is possible. This is because a vertically-integrated firm with a monopoly over network infrastructure has an incentive to discriminate against competing firms that need to access this infrastructure. Regulating against such discrimination, for example in the telecommunications sector, can be difficult (PC 2001).

Although getting regulation right is challenging, Australia has developed sophisticated regulatory arrangements, and this means that the rationale for government ownership of some businesses with natural monopoly characteristics no longer holds (PC 2013c).

In a recent inquiry, the Commission found that, for electricity network businesses:

> … the empirical evidence suggests that, although some perform relatively well, as a group, the aggregate productivity outcomes of state-owned businesses are poorer than their private peers. (PC 2013c, p. 24)

There is also evidence that in some sectors, such as airports, outcomes following privatisation have at least been consistent with the objective of achieving more efficient investment (PC 2012c).

Government trading enterprises

In many cases, public infrastructure is controlled by government trading enterprises (GTEs). They are common in utility sectors, including water and electricity, and can also be found in sectors such as rail and ports. GTEs usually undertake regular capital expenditure. However, whether they can undertake major infrastructure investment depends on whether they are accorded the ability to borrow in their own right. If not, or if there are significant limits, the final decision on major investments will still be with governments, and some of the benefits of the GTE model cited below may not apply.

GTEs are government-owned or government-controlled entities that produce goods and services on a commercial basis by substantially or fully covering their costs. They are outside the general government sector, being established as separate legal entities that generally have their own boards. Some, but by no means all, are company GTEs subject to the *Corporations Act 2001* (Cwlth). Where the Corporations Act applies, this places a legal duty on directors to act in the interests of the company and provides a framework that may discourage (and potentially penalise) attempts by governments to influence directors for political expediency. Some GTEs that are not subject to the Corporations Act have governance frameworks that place similar duties on directors.

The potential benefits in moving from provision by a government department to corporatised GTE provision can be somewhat similar to those from privatisation. It can strengthen incentives and accountabilities for efficient project selection, and for reducing costs and creating customer value. However, the profit motive of owners (governments) and their agents (GTE executives and other employees) does not operate in the same way as for private firms. GTEs have no threat of takeover and the board and executives are relatively well protected compared to those in the private sector.

These factors result in the incentives for efficiency not being as strong as for private firms, and in general capital is not as efficiently deployed. In addition, the role

played by the government as owner inevitably has an influence, which can work against efficient investment. For example, governments have been known to extract 'special dividends', which can compromise long-term investment by the GTE, or try to influence GTE decision making for political gain.

Government ownership can also bring with it policies specifically applying to government entities (such as employment conditions), the requirement to protect public funds, protection from bankruptcy, and greater potential for ministerial, political and policy intervention. Such interventions may be prompted by the tendency of the public to hold governments accountable for GTE errors (but not necessarily crediting them for good performance). Ultimately, any entity with a Board appointed by a Minister or Ministers will need to pay heed to government perspectives on the public interest when making decisions on matters such as borrowing to invest in large infrastructure projects. Additionally, governments cannot credibly allow a GTE to go bankrupt, and hence will always wish to exercise some powers over their debt issuance and financial performance.

The Commission has examined these issues in sector-specific inquiries, including on urban water (PC 2011a) and electricity networks (PC 2013c). Some general principles are that:

- GTEs should be assigned clear and non-conflicting objectives
- directors should be appointed on merit, following a transparent selection process
- any ministerial directions to GTEs should be publicly disclosed
- non-commercial functions undertaken by GTEs should be funded by governments through community service obligation payments
- dividend payments to governments should, over time, be based on an appropriate return on public funds, and they should not be influenced by the government's fiscal position
- oversight arrangements should be established to ensure accountability for performance.

Application of these principles can improve the performance of GTEs. However, GTEs do not have the same incentives to promote efficiency as private shareholders and government owners will inevitably have some influence. Where the objective is to achieve the most efficient project selection and management of assets, privatisation (where feasible) can often be preferable.

Reforming institutional arrangements

It follows from the above discussion that there may be advantages in altering the institutional arrangements for some sectors, from those that involve governments making decisions about which public infrastructure projects proceed, to those where this is done by either GTEs or the private sector. Such reforms can create more market-oriented arrangements in which customers pay for and receive services from providers, who in turn must plan and invest to meet future demand. This can more effectively match the demands of consumers with the supply of producers.

Reforms of these types can result in improvements in project selection, and also in the efficiency of project implementation and management of existing infrastructure assets. There are also potential pitfalls, and a need to tailor institutional and governance arrangements to the circumstances in individual sectors. Accordingly, decisions about these reforms require careful consideration.

Privatisation that is done with a view to private firms then making decisions about new infrastructure investments, by its nature, ensures that new projects are privately financed. Accordingly, privatisation is one means of, in the words of the inquiry terms of reference, 'encouraging private financing … for major infrastructure projects'.

Privatisation has been raised by participants in this inquiry mainly in the context of 'capital recycling' — that is, selling existing infrastructure assets and using the proceeds to finance new infrastructure projects (Consult Australia, sub 23; BCA, sub. 39; Australian Logistics Council, sub. 48, Westpac, sub. 51; and others). The Commission's view is that privatisation should only occur when it is in the community's interests in its own right, as a tool to improve efficiency. What is done with the proceeds is essentially a separate issue. Linking the two issues through capital recycling may help to build community support for privatisation, but there are also risks, as discussed in chapter 6.

Privatisation has the potential to increase economic efficiency and be in the public interest where:

- user charges make commercial operation feasible
- private ownership can be made compatible with legitimate public policy objectives, through structural separation, regulation, sale conditions and government payment for appropriately valued community service obligations
- sale proceeds exceed the value of the assets under continued government ownership.

This inquiry's draft report recommended further privatisation of electricity businesses and major ports. This was supported by some inquiry participants (Australian Contractors Association, sub. DR169; Consult Australia, sub. DR168; Office of the Infrastructure Coordinator, sub. DR185) and opposed by others (Electrical Trades Union, sub. DR159). In the Commission's view, there is sufficient evidence from experience and previous inquiries that, if undertaken appropriately, it is in the public interest to privatise electricity generation, network and retail businesses, and major ports. The transition to privatisation involves a range of activities, including effective communication with the community, that require careful management and leadership (PC 2013c).

RECOMMENDATION 2.1

State and Territory Governments should privatise their government-owned:

- ***electricity generation, network and retail businesses***
- ***major ports.***

Privatisation should be subject to appropriate processes to ensure that the public interest is protected through structural separation, regulation, sale conditions and community service obligations.

The Business Council of Australia suggested that water assets could also be privatised, provided sufficient safeguards were in place (BCA, trans., pp. 331–2). Infrastructure Partnerships Australia sounded a note of caution about ad hoc privatisations in the urban water sector:

> We know that a number of jurisdictions have been looking at their urban water and waste water sectors, trying to identify areas where they can cash out some of their chips. The concern I have is that if we haven't resolved what the market structure is going to be, what the most efficient long-run structure for urban water and waste water markets is, then we may find that we have sold sections of different networks that sit right in the middle that either make it impossible or prohibitively expensive to be able to go back and fix those market structures. (trans., p. 204).

The Commission's view is that the priority for the urban water sector should be to make improvements under a GTE model. This would involve assigning responsibility for both the procurement of new water supply infrastructure and the service delivery to GTEs that retail and distribute water, under a portfolio manager framework (box 2.4).

Some infrastructure businesses owned or part-owned by the Australian Government have also been suggested as being suitable for privatisation, including the Australian Rail Track Corporation (ARTC) and Snowy Hydro. Airservices

Australia is another Australian Government infrastructure business that could be considered for privatisation.

Box 2.4 **Portfolio manager framework for urban water**

Under the portfolio manager framework, a monopoly retailer–distributor is established with an obligation to serve customers and procure water to meet customer demands. The portfolio manager controls (but does not necessarily own, finance or physically operate) the dispatch and transport of various sources of water supply in their portfolio (including changes to storage) from the bulk sources to consumers. To expand competition for the supply of bulk water services, the portfolio manager runs a competitive procurement process for the expansion of supply capacity, which can be built, financed and operated by the private sector.

In the absence of a market for water, the portfolio manager can estimate the opportunity cost of supplying a unit of water and implement flexible pricing that emulates an efficient market outcome. The opportunity cost of supplying a unit of water can then be used to formulate a range of tariffs. This would allow consumers to express their preferences on security of supply and price stability, and provide an opportunity for the portfolio manager to manage demand more efficiently as water availability changes over time due to the variable nature of rainfall.

Source: PC (2011a).

The National Commission of Audit (2014) recommended that ARTC be privatised in the medium term, noting that this could include just the Hunter Valley rail network (that services the coal industry) or all of ARTC. Infrastructure Australia identified those parts of ARTC which were potentially profitable as being suitable for privatisation. These being the Hunter Valley network and the east west rail corridor (Melbourne/Sydney–Perth) (Office of the Infrastructure Coordinator, sub. 78, attach. B). These comments suggest that a scoping study would be desirable before a final decision is made on privatisation of all or part of ARTC.

The National Commission of Audit (2014, p. 222) also recommended that Snowy Hydro be privatised following a scoping study that could, among other things: 'examine the potential benefits of a sale for the operation of the National Electricity Market and implications for the management of water resources'.

Snowy Hydro is owned by the Australian Government (13 per cent), NSW Government (58 per cent) and the Victorian Government (29 per cent) and so privatisation is an option that should be considered by all three governments. Each of these governments would be able to sell their share independently of whether the other two sold theirs. Indeed, the NSW Government announced plans to sell its

share in 2005, envisaging at that stage that the remainder would stay in public ownership (EnergyNewsPremium.net 2005).

Being an electricity generator, Snowy Hydro could be considered to be within the scope of recommendation 7.1. However, given its involvement in water diversion, storage and release, there are additional issues to consider and a scoping study should seriously consider them.

The Productivity Commission has not done sufficient analysis to come to a conclusion on whether ARTC and Snowy Hydro should be privatised, and scoping studies would be appropriate.

The National Commission of Audit also recommended that an independent review be undertaken of Airservices Australia, with a particular focus on the scope of its activities and its planned capital expenditure program. In the Commission's view, Airservices Australia could potentially meet the criteria that would make it suitable for privatisation. It has made a profit and paid a dividend in recent years, and operates within an established regulatory regime (including economic regulation). Reforms of previous governments have ensured Airservices Australia is a pure service provider and undertakes no safety regulatory functions — indeed it must hold licences from the air safety regulator.

It is common in Europe for aviation fire and rescue services and air traffic control around airports to be provided by individual airport operators or their contractors — indeed there is requirement for larger airports to periodically market test these air traffic control services. In the United Kingdom, en route air navigation services (including over the Atlantic Ocean) are provided by a company that has majority private ownership. Accordingly, there would be merit in conducting a scoping study that considered privatisation of some or all of Airservices Australia's activities.

RECOMMENDATION 2.2

The Australian Government should conduct scoping studies to investigate the efficiency gains and other merits of privatising some or all of the business activities of the Australian Rail Track Corporation and Airservices Australia. The study into Airservices Australia should include a review of the efficiency of its capital expenditure program, as recommended by the National Commission of Audit.

The Australian, New South Wales and Victorian Governments should similarly investigate the sale of Snowy Hydro. Sale of shares by any one of these governments should not depend on the decisions made by the other governments.

Corporatisation and privatisation of public infrastructure in Australia has generally occurred in those sectors where well established direct user charging arrangements are in place. The assignment of this revenue to service suppliers is a key element of these models as it provides a commercial funding stream and establishes the customer-supplier relationship. Accordingly, it is likely that if more extensive direct user charging were introduced to a sector (such as roads), it may become feasible to implement elements of a corporatised GTE model, along the lines that exist in regulated utility sectors. This issue is considered in chapter 8 (following consideration of funding in chapter 4).

It is also important to consider whether improvements can be made to the institutional and governance arrangements for those sectors in which governments continue to be the selector of projects. As discussed in the following section, cost–benefit analysis has an important role to play in this. Coordination between governments (such as the arrangements under which the Australian Government provides funding and other forms of financial assistance for public infrastructure to State and Territory Governments) is also important, as discussed in chapter 7.

2.3 The role of cost–benefit analysis

Sound project selection requires considerable work to be put into identifying deficiencies in infrastructure services that are likely to emerge as a result of population growth, changing patterns of demand and the ageing of existing infrastructure. Options need to be identified and scoped to determine those which appear to have the greatest promise, taking into account constraints such as regulations protecting social and environmental amenity. Typically, some options will relate to improving the utilisation of existing assets and some to major upgrades or the development of wholly new infrastructure. Cost–benefit analysis is a tool that can be used once this important preliminary planning has been undertaken.

Cost–benefit analysis can be used to assess whether a proposed public infrastructure project is likely to provide positive net benefits to the community (sometimes termed ‘net social benefits’). Various projects can be compared, as can different design and implementation options for a given project. The value of retaining the flexibility to defer, modify or cancel projects can also be estimated. Because of its focus on net benefits to the community, cost–benefit analysis is generally of most relevance where governments are responsible for project selection decisions.

Accordingly, well conducted cost–benefit analysis can play an important role in project selection, particularly where these decisions rest with governments. Making cost–benefit analyses public (with clearly documented assumptions) for both

projects that have been selected, and those that have been rejected, greatly improves the transparency of decision making. Such transparency strengthens the incentives for decision makers to focus on the overall net benefits of projects. It also allows particular estimates (for example, of construction costs or patronage) to be debated and testing done on how the use of different estimates would affect the projects net benefits. Transparency can help to improve the quality of analyses because proponents and practitioners know that any flaws are likely to be exposed.

About cost–benefit analysis

Cost–benefit analysis involves aggregating impacts on all members of the community and appropriately taking account of risks. As stated by Ergas (2009, p. 12) 'In essence … cost–benefit analysis asks whether the sum of the amounts the individuals who comprise the community at issue would be willing to pay for the project to proceed exceeds the costs of that project'.

Cost–benefit analysis allows information to be analysed in a logical and consistent way and encourages decision makers to take into consideration all costs and benefits of a project, rather than making decisions based on selected impacts only. To provide a reliable guide to what is in the overall interest of the community, cost‑benefit analysis needs to be broad, taking into account all relevant economic, social and environmental outcomes.

For example, benefits from a new toll road might include the value of travel time savings on both the toll road and the wider transport network, reductions in accidents and reductions in pollution (by contrast, a financial analysis might treat toll revenue as the sole benefit). As is appropriate, benefits that take the form of productivity improvements (such as reduced travel time for transporting goods) count the same as other types of benefits (such as reduced travel times for commuting or recreational trips).

The standard decision rule is that projects with positive net benefits should be accepted. However, where there are mutually exclusive projects, the one with the highest net benefits should normally be preferred. Where there is a budget constraint and projects are not mutually exclusive, it may be useful to calculate the benefit–cost ratio of each project. This can help determine the set of projects with the greatest net benefit (appendix C).

As suggested by Edwards (sub. DR118), because there is always some uncertainty about the inputs to the analysis, a project with a benefit–cost ratio slightly above one cannot definitively be said to be in the community's interests. Indeed, unless the

tendency for optimism bias is successfully overcome (discussed later), a project with a benefit–cost ratio just over one will likely impose net costs.

Governments may sometimes have legitimate reasons to make project selection decisions that run contrary to the rankings suggested by cost–benefit analysis. For example, because some aspect of a project that was not able to be quantified in monetary terms was considered important. As argued by some inquiry participants, this could relate to equity considerations (Australian Local Government Association, sub. DR137; National Growth Areas Alliance, sub. DR133). The reasons for such decisions should be clearly explained and debated. The ACT Government's decision to proceed with a light rail project appears to be an example of where the results of cost–benefit analysis have been ignored without a valid explanation (box 2.5).

Cost–benefit analysis can also be used to show the impacts of a project (or policy) on particular groups, such as regional communities or low-income households. This can inform value judgments by decision makers about whether a response to distributional (or equity) issues should be made, ideally following community debate. For example, whether any groups that are left worse off by a project should be compensated.

Cost–benefit analysis enables projects to be judged, not only on construction costs, but also long-term maintenance and operating costs. A good project assessment has the capacity to provide information as to the relative resources that should be devoted to the initial construction versus longer-term operating costs — for example, a more expensive initial construction could reduce ongoing costs.

Due to the broad perspective taken, cost–benefit analysis is different from the financial analyses of investments that are done by firms. Firms, naturally enough, are primarily interested in the expected net financial benefits of an investment that accrue to the firm and so conduct analyses designed accordingly. That said, some of the inputs are the same or similar, such as estimates of capital cost and demand for the services provided by the infrastructure.

Firms usually devote considerable resources to analysing large investment proposals and it is appropriate for governments to do the same. For example, for a billion dollar plus project, it could be worthwhile to spend tens of millions of dollars on the analysis. This might include elements such as: detailed engineering work to firm up construction cost estimates; demand analysis using purpose built models; risk analysis; and assessment of externalities.

Appendix C provides further information about cost–benefit analysis, the steps involved and some of the potential pitfalls that need to be avoided.

Box 2.5 **Canberra light rail**

In a submission to Infrastructure Australia in 2012, the ACT Government analysed a number of options including bus rapid transit (BRT) and light rail rapid transit (LRT). The analysis estimated that the upfront capital costs for the BRT and LRT would be $276 million and $614 million respectively (on an undiscounted basis) (ACT Government 2012).

In its economic appraisal (which is essentially a cost–benefit analysis), the ACT Government found net present values of $243.3 million for BRT and $10.8 million for LRT. The benefit–cost ratio for BRT was estimated at 1.98, with 1.02 for LRT. In the assessment, the benefits of BRT and LRT were similar ($491.8 million against $534.9 million respectively), but the cost of BRT was less than half that of LRT ($248.5 million against $524.1 million, when discounted by 7 per cent). The cost–benefit analysis took into account a range of factors including journey times, and avoided environmental impacts and accidents (ACT Government 2012).

The ACT Government submission concluded that:

> Of the transport options, BRT is projected to deliver higher economic returns. On the other hand, the economic returns that can be delivered through LRT investment alone are likely to be economically marginal and the net economic outcome for LRT under even minor adverse circumstances is likely to result in negative economic returns. (2012, p. 29)

Subsequently the ACT Government announced that it would proceed with LRT (Corbell 2013). In explaining the choice of light rail, reference was made to an earlier report by URS Corporation that found:

> A triple bottom line evaluation undertaken of these options [BRT and LRT], comparing their social, economic and environmental impacts to the 'do-nothing' scenario has shown LRT to provide higher benefits due to its higher social benefits. (URS 2012, p. 54)

This 'triple bottom line evaluation' does not appear to provide a sound basis for determining the merits of the LRT and BRT options. First, it was conducted before the cost–benefit analysis discussed above, and accordingly appears to use less up-to-date information. Second, it employed a much less reliable form of analysis than cost−benefit analysis.

The triple bottom line evaluation used a qualitative rating system that involved assigning between one and five stars to a range of criteria, such as 'reduction in car trips', 'upfront capital expenditure' and 'fit with planning and policy strategies' (this is a type of multi-criteria analysis). For example, for upfront capital expenditure LRT was assigned five negative stars and BRT four negative stars. The number of stars for negative criteria were then subtracted from the stars for positive criteria to give an overall score. The reliability of these scores appears to be low because there seems no basis for supposing that each star is of equivalent importance.

In summary, a cost–benefit analysis showed BRT to be a greatly superior option than LRT. That a less reliable form of analysis based on less up-to-date information showed LRT to be slightly superior (the overall difference was one 'star'), would not appear to provide a sound basis for overlooking this and deciding to proceed with light rail.

Cost–benefit analysis compared to other types of analysis

There are various other types of analysis that governments can use either instead of, or in addition to, cost–benefit analysis in assessing public infrastructure proposals. These include multi-criteria analysis, input-output analysis and computable general equilibrium (CGE) modelling (box 2.6). The Commission's assessment is that none of these types of analysis is a suitable replacement for traditional cost–benefit analysis.

One motivation for using multi-criteria analysis is to avoid assigning dollar values to outcomes that are difficult to value (such as environmental outcomes). However, the method usually does *implicitly* assign dollar values (Dobes and Bennett 2009). Further these implicit values are usually determined by an individual or small group and do not represent community preferences (unlike the values in cost–benefit analysis) (Baker and Ruting 2014). Pickford (2013) examines the effects of basing land transport investment decisions in New Zealand on a form of multi-criteria analysis instead of cost–benefit criteria. He presents evidence indicating that 'there has been a loss of prospective benefits of many hundreds of millions of dollars' (Pickford 2013, p. 34).

Input-output tables provide information about interdependencies between industries that have a number of legitimate uses. However, the use of multipliers derived from these tables to estimate the flow-on effects of infrastructure and other investment projects can exaggerate their benefits (Gretton 2013). In essence, this is because such analysis takes into account indirect benefits, but not opportunity costs. A major infrastructure project will inevitably bring about new economic activity. For example, a new train station may attract new retail stores. However, the capital, labour and other resources used to build and operate these stores would generally be expected to be deployed elsewhere were the train station not built. This is not taken into account in input-output analysis.

Because of these deficiencies, multi-criteria and input-output analysis are unlikely to have any useful role to play in assessing the economic merits of infrastructure investment proposals. Indeed, they have the potential to obscure the costs and benefits of proposed projects, and have sometimes been used for precisely that reason. The situation with CGE modelling is more complicated, and some economists argue there are advantages in using it to complement cost–benefit analysis (Forsyth, sub. DR117).

Box 2.6 Alternative types of analysis

Multi-criteria analysis

There are many variants of multi-criteria analysis, but it usually involves defining policy objectives, determining a set of criteria to measure performance against each objective and assigning weights to criteria. Typically, some criteria relate to market factors (such as the cost of funding a project) and some to non-market outcomes (such as environmental effects). Each project (or policy) option is given a score for each criterion and these are weighted and added up to give an overall score. Multi-criteria analysis is an alternative to cost–benefit analysis that is often used because it is simpler and avoids the need to assign dollar values to environmental outcomes (Dobes and Bennett 2009).

Input-output analysis

Input-output tables describe production and consumption interdependencies, usually at the regional or national level. Individual industries employ labour and capital, use resources, and purchase inputs from other industries and overseas. They sell their products to other producers and to consumers, both domestically and internationally. It is these economic flows that are recorded in input-output tables, typically according to product and industry classifications (Gretton 2013).

Input-output tables can be used to compute output, employment and income multipliers. These multipliers are used in input-output analysis to estimate the possible direct and indirect economic effects brought about by a project or policy. For example, the direct effects of new irrigation infrastructure might be to increase agricultural production and the indirect effects might relate to increased processing and transportation of that production, as well as greater retail activity in nearby towns.

Computable general equilibrium (CGE) modelling

CGE models improve on the input-output framework by overlaying economic theory (in particular, incorporating factor constraints and relative-price-based substitution). CGE models include representations of all markets within a national economy (sometimes with regional detail) as well as macroeconomic constraints. Industries produce outputs using intermediate inputs and factors, which are sold to intermediate and final users (such as households, governments and exports). Users can substitute between factors, products and sources (imported or domestically produced) based on relative prices.

CGE models are typically used to quantify the industry or regional output and employment impacts of policies and projects. At a more aggregate level, CGE models are also used to estimate impacts on macroeconomic variables such as gross domestic/state/regional product and household consumption, as well as changes in the trade balance or government revenue collections. CGE models can be used to report on the welfare impacts of projects (that is, their net social benefits) or a proxy measure of welfare, such as net national income. However, calculating welfare in a CGE model can be difficult, and results are often dependent on the assumptions contained in the model (such as aggregation and stylised industry representations).

Unlike input-output analysis, CGE modelling does take account of opportunity costs. Forsyth stated that CGE models:

> … are complete models of the economy, or of the sectors that are of interest. Intentionally there are no loose ends- thus all inputs and outputs are accounted for, and the sources of all factors are accounted for. (sub. DR117, attach. 1, p. 5)

The main argument for using CGE modelling is that it can provide reliable estimates of the indirect effects of projects, and that these are often ignored or estimated in an ad hoc manner in cost–benefit analysis. For example, Forsyth (sub. DR117) reported that a cost–benefit analysis of an airport in Sydney assumed that inbound tourism benefits would be equal to 25 per cent of tourism expenditure. That is, that 25 per cent of the additional tourism expenditure attributable to the airport would be a net gain to Australia. Forsyth argued that CGE modelling suggested that the tourism benefits were likely to be substantially lower than this.

There are two conclusions that can be drawn from this example. First, CGE modelling can be useful for estimating the indirect benefits of infrastructure. However, this does not necessarily require CGE modelling to be used to assess the entire project. It could instead provide values that can be used in cost–benefit analysis (this 'gap filling role' is acknowledged by Forsyth).

Second, attention needs to be given to how indirect effects are incorporated into cost–benefit analysis. The standard approach is to ignore indirect effects in undistorted secondary markets because including them would be double counting (appendix C). For example, counting both the benefit of travel time savings and any uplift in real estate prices from a transportation project would be double counting. Where indirect effects are thought to be particularly important and are genuinely additional to direct effects, sophisticated approaches that avoid ad hoc assumptions are likely to be warranted. For example, detailed traffic models that incorporate economic theory are sometimes used to estimate the effects of a new road on the rest of the road network and on alternative transport modes. The use of such models may be warranted where a significant proportion of the benefits of a road project is expected to come from reducing congestion in the broader transport network.

Although CGE modelling can play a useful role in assessing infrastructure projects, there are potential disadvantages when it is used in other than a gap filling role. First, it is important that any analysis is fit for purpose. Since CGE models represent the entire economy they typically require industry and regional aggregation, and stylised representations of industry technologies. For example, a single transport sector might cover all modes of transport, without regard to the cost differences between trains and cars, or the structural differences between urban and regional transport. These assumptions can be a poor fit with the inherently specific task of

assessing an individual project. Forsyth points out that sub-models can be built to address these problems. However, this is not always done, with existing models used for tasks for which they are not well suited.

Second, the results of CGE modelling exercises can cause confusion, rather than providing insight. For example, a study of Melbourne transport options reported that the benefit–cost ratio of one option was 0.7 (Meyrick and Associates 2008). The meaning of this is clear, the benefits to the community of this option are expected to be only 70 per cent of the costs, suggesting that it is unlikely to be in the community's interests. However, the study also reported CGE modelling estimates that the project would increase gross state product for 2031 by $624 million. At first glance, this would seem to suggest that the project is worthwhile. However, gross state product is not a measure of community welfare and so the result does not, in fact, indicate that the option is in the community's interests.

At present, cost–benefit analyses are not always done for major public infrastructure projects, and those that are done are not always of high quality. In the Commission's view, the priority should be to rectify this situation, rather than increasing the number of projects that are assessed using CGE modelling. That said, CGE modelling may be able to add insights on the likely indirect benefits of large projects, provided it is undertaken appropriately and the results properly explained.

Achieving high-quality cost–benefit analysis

For cost–benefit analysis to play a useful role in guiding project selection, it needs to be of high quality and be consistently applied. It also needs to be fully disclosed, including any assumptions that have been made and the full methodology used to reach the estimates. That is, readers of the analysis should be able to fully replicate the results from the information provided.

As Borland argued:

> Cost–benefit analysis can be the foundation of an improved approach for decision making on infrastructure development in Australia. But cost-benefit is not a magic bullet. It will only help if it is used in a careful and rigorous manner. (sub. 102, p. 2)

Three of the key aspects are considered below. Appendix C provides further discussion on how to avoid problems in cost–benefit analysis.

Countering optimism bias

In conducting cost–benefit analysis, attention needs to be given to the potential for optimism bias. According to the UK Government:

> There is a demonstrated, systematic, tendency for project appraisers to be overly optimistic. This is a worldwide phenomenon that affects both the private and public sectors. Many project parameters are affected by optimism — appraisers tend to overstate benefits, and understate timings and costs, both capital and operational. (UK Government 2011, p. 29)

In a review commissioned by the UK Treasury, which examined 20 years of major public procurement projects in the United Kingdom, the average optimism bias was estimated as 17 per cent for work duration, 47 per cent for capital expenditure, 41 per cent for operating expenses and 2 per cent for benefits shortfall (Mott MacDonald International Ltd 2002). The study also found that the level of bias in projects procured using public private partnerships was lower, partly because of a more rigorous approach to risk analysis, and more robust and realistic business cases.

Flyvbjerg (2009) documents the large differences that are often seen between *ex ante* and *ex post* estimates of costs and benefits for major infrastructure projects internationally (box 2.7). Flyvbjerg (2009, p. 353) concludes that these differences adversely affect project selection, as 'it is not the best projects that get implemented, but the projects that look best on paper'.

The International Centre for Complex Project Management argued that:

> Australia needs to learn from the experience of the United Kingdom and other governments and address the key factors identified that lead to over optimism and, ultimately, project failure. (sub. 105, p. 14)

At least to some extent, optimism bias can be countered by rigorous analysis of the risks faced by the project. An additional approach is to use reference class forecasting. As the OECD explains:

> With this technique an outside view is taken in order to add a reality check to planning forecasts by examining outcomes (time taken for completion, cost, traffic levels etc.) for similar past projects. (2013, p. 34)

Reference class forecasting does not try to forecast the specific uncertain events that will affect the particular project, but instead predicts outcomes based on those actually achieved for a set of similar past projects. Chapter 9 discusses this technique and recommends data collection arrangements that would facilitate its use.

Box 2.7 ***Ex ante* estimates of costs and benefits are often inaccurate**

Flyvbjerg conducted an international survey of transport projects to determine the size of the 'gap', on average, between estimated and actual project costs, and estimated and actual passenger traffic.

For project cost estimates, Flyvbjerg examined 258 projects in 20 nations on five continents over 70 years, and found the following (in constant prices).

- *Rail projects:* for the 58 case studies examined, on average, the actual cost was 44.7 per cent higher than the estimated cost.
- *Bridge and tunnel projects:* for the 33 case studies examined, on average, the actual cost was 33.8 per cent higher than the estimated cost.
- *Road projects:* for the 167 case studies examined, on average, the actual cost was 20.4 per cent higher than the estimated cost.

The data show that 90 per cent of projects experience cost overruns, and that cost overruns in the order of 50 per cent are common. Forecasting errors vary widely across types of projects and significantly differ between sectors. Cost overruns are constant for the 70 year period covered by the study — that is, the accuracy of cost estimates did not improve over time.

Flyvbjerg also presents evidence of inaccurate forecasts of rail and passenger traffic. Having examined 208 projects in 14 nations on five continents over 30 years, he found the following.

- *Rail projects:* for the 25 case studies examined, on average, the actual traffic was 51.4 per cent lower than the estimated traffic.
- *Road projects:* for the 183 case studies examined, on average, the actual traffic was 9.5 per cent higher than the estimated traffic.

The data show that:

- for rail projects, 90 per cent have overestimated traffic, and 84 per cent overestimate the traffic by more than 20 per cent
- for road projects, the number of roads with overestimated and underestimated traffic is about the same, but 50 per cent of road forecasts have under or overestimated passenger traffic by more than 20 per cent.

Passenger forecasting errors differ substantially between road and rail projects, and inaccuracy in passenger forecasts is constant for the 30 year period covered by the study — that is, the accuracy of passenger forecasts has not improved over time.

Finally, Flyvbjerg reported data suggesting that cost overruns for information technology projects were, on average, even larger than for transport construction projects. He argued that this result was particularly significant because information and communications technology has become a large and rapidly increasing part of more major infrastructure projects.

Source: Flyvbjerg (2009).

Although these technical approaches are useful for at least partly offsetting optimism bias, unrealistic cost and demand forecasts also arise due to strategic misrepresentation. That is, proponents of a project often have a personal stake in it proceeding and so have an incentive to make it appear better than it really is. That is, to overstate benefits and understate costs and risks. Although technical guidelines on how to conduct cost–benefit analysis can go some way to countering strategic misrepresentation, strategic forecasting techniques tend to evolve to out-manoeuvre rules established to counter them (OECD/ITF 2013).

Accordingly, attention also needs to be given to the institutional and governance arrangements within which analyses are done. Part of this relates to increasing transparency and accountability by publicly releasing and independently auditing analyses (discussed later).

Appropriate treatment of risk and uncertainty

As indicated, appropriate treatment of risk in cost–benefit analysis is necessary to counter optimism bias. Often, this means ensuring that the costs and benefits used are expected values based on the probability of different outcomes, and that the discount rate is appropriate for the project. Full risk analysis (for example, using Monte Carlo simulations) is generally required for large projects with many uncertain variables (appendix C). Ad hoc approaches, such as using a higher discount rate to counter overly-optimistic cost and benefit forecasts, are likely to perform poorly.

Another aspect of dealing with risk and uncertainty is recognising that better information may become available over time. For example, waiting a year allows uncertain estimates of inflows to dams for that year to be replaced by actual inflows. This can improve estimates of the benefits of proceeding with a water supply infrastructure project. Of course, there can also be a cost of delay.

Because delaying a major investment decision until more information becomes available can lead to a better decision, it is generally preferable not to commit to investments earlier than necessary. Similarly, taking actions that enable decisions to be delayed, for example doing preparatory work to reduce the lead time for building infrastructure, can be worthwhile.

A further implication is that abandoning a project shortly before contracts are signed — where this is desirable given new information — can be worthwhile, even if it requires compensation to be paid to shortlisted bidders. Indeed, the option of abandoning a project once it commences may be valid, and it may also be useful to keep appropriate options open to rescale a project when a re-assessment of its scope

suggests that the risks of failure have significantly increased. Expended resources are a sunk cost and should not influence decisions going forward.

Analysis of these sorts of situations can be undertaken using the 'real options' approach. The real options approach to investment under uncertainty has been developed over the past 20 or 30 years and applied in a wide range of contexts (PC 2011a).

The Commission acknowledges, as a practical matter, that there are significant reputational, management, governance and accounting issues for both government and private entities associated with writing off large sunk infrastructure investments. However, this does not change the fact that high costs can be imposed on the community by a reluctance to reassess projects in light of new information.

Cautious and consistent treatment of 'wider economic benefits'

Infrastructure projects create direct benefits for users of the services provided by public infrastructure. Where cost–benefit analysis of a proposed project is done, such benefits are routinely estimated and included. However, projects can also create wider economic benefits, such as 'agglomeration spillovers' (appendix C). For example, Lowe (2013) argued that investment in transportation infrastructure, in addition to reducing travel times and stress, had some less obvious benefits:

> One of the less obvious benefits is what economists sometimes call agglomeration spillovers. Effective transportation networks deepen markets. They bring consumers closer to more businesses, and they bring workers in contact with more opportunities. These deeper markets and connections promote competition. They promote greater specialisation by both firms and workers. And they promote innovation and a more dynamic economy.

Whether or not to include wider economic benefits in cost–benefit analyses, and if so, how to estimate them, is contentious. In principle, genuine wider economic benefits should be taken into account in assessing the merits of projects. The difficulty arises because their estimation is in its infancy (IA 2013b). Accordingly, the inclusion of wider economic benefits in cost–benefit analyses has the potential to show one project to be superior to another purely because of differences in the way such benefits are defined and estimated.

Infrastructure Australia currently accepts studies on the wider economic benefits of projects, but treats them separately to the traditional cost–benefit analysis. It also provides advice on the preparation of such studies (IA 2013b). This would appear to allow for an appropriately cautious and consistent treatment of wider economic benefits. The key here is full transparency, as the necessity to justify the

methodology and assumptions acts as a significant constraint on poor decision making and arbitrary, poorly constructed analysis to justify a favoured project. There are limited resources for infrastructure procurement (like all procurement) and the opportunity cost of choosing the wrong projects, or having the wrong scale, is significant.

Improving transparency and accountability

As discussed earlier, some major public infrastructure projects proceed without being subject to cost–benefit analysis. In addition, where such analyses are done they are often not made public. The Office of the Infrastructure Coordinator reported:

> Infrastructure Australia has championed since its inception, the importance of transparent cost benefit analysis in infrastructure prioritisation. …
>
> While Infrastructure Australia has encouraged proponents to release their cost benefit analysis studies themselves, unfortunately, few have, to date, been released. (sub. 78, attach. A, p. 12)

The benefits of transparency were well expressed by Forsyth:

> There are several gains from transparency. Open and transparent evaluations can be critiqued, and errors found and addressed. The importance of key assumptions, which will affect the result of the evaluation, can be debated and the reliability of the evaluation can be assessed. At times, additional studies may be commissioned (as with the Sydney Harbour Tunnel studies), and the understanding of the problem can be enhanced. Vested interests will be more apparent. (sub. DR117, p. 6)

An additional benefit is that publicly released analyses are available to private entities that bid for the delivery of projects. While such entities will inevitably need to do their own analysis, public disclosure of the government's analysis can avoid the need to duplicate some aspects. Disclosure can also help bidders to develop more accurate estimates.

The potential benefits of transparency are illustrated by submissions made by Goldberg (sub. 84 and DR179). Goldberg reported that he was initially denied access to a cost–benefit analysis conducted for the Northern Sydney Freight Corridor program, but that he eventually obtained it under the *Freedom of Information Act 1982* (Cwlth). Goldberg has made a number of criticisms of this analysis, claiming that it greatly overstates benefits and understates costs. In the Commission's view, it would have been preferable for the analysis to have been made publicly available at the outset. This would have allowed the sorts of criticisms made by Goldberg to be put forward and debated at an early stage and the analysis revised where warranted (box 2.8).

Box 2.8 **Analysis of the Northern Sydney Freight Corridor program**

The Northern Sydney Freight Corridor program involves four projects to remove bottlenecks along the existing rail corridor between Sydney and Newcastle. The projects involve constructing passing loops at two locations, a rail underpass, six kilometres of new track to separate freight and passenger trains, and some other associated works.

A business case, incorporating a cost–benefit analysis, for the program was conducted by Deloitte in 2011. The results of the economic evaluation presented in this report show costs of $669 million and benefits (excluding wider economic benefits) of $1841 million, based on a 7 per cent real discount rate. Accordingly, the net present value is $1172 million and the benefit–cost ratio is 2.7 (Deloitte 2011). The majority of the benefits flow from forecasts for freight transport (in net tonne kilometres) growing strongly and being substantially higher with the program. By the year 2040, the 'with program' forecast is around twice the 'without program' forecast and nearly four times actual 2010 levels.

Dr Goldberg has criticised this cost–benefit analysis on a number of grounds. For example, he has disputed the ability of the limited increase in rail capacity brought about by the program resulting in the large benefits claimed. Goldberg also argued that the capital cost used in the analysis is $345 million less than that reported by official NSW Government sources (sub. 84).

It is sometimes argued that there are commercial-in-confidence reasons for not making cost–benefit analyses public. Typically such analyses are done prior to the procurement process commencing and so the data used are unlikely to be commercially sensitive. Accordingly, the Commission is not convinced that there are valid commercial-in-confidence reasons to withhold the release of full cost‑benefit analyses. Even where data are provided by private participants, the normal presumption of transparency should prevail as a condition of involvement in government-backed projects.

The Victorian Government (sub. DR196) argued that there were occasions where public disclosure of cost–benefit analyses could jeopardise a government's ability to optimise value for money through competitive tender processes. The concern appears to be that disclosure might prompt firms to 'bid-up' to the cost estimates included in the analysis.

However, if the bidding process is truly competitive this is unlikely to occur because firms will have an incentive to bid based on their true willingness to enter into a contract. Moreover, the costs estimates used in cost–benefit analyses are known to be (and should be expected to be) surpassed by better knowledge as project design work develops, which in sound project development occurs prior to

tender. Making cost–benefit analyses public is also consistent with other initiatives to increase the transparency of the costs of infrastructure, including:

- the widespread use of benchmarking in the United Kingdom and other countries, including to condition market expectations of costs
- build-to-cost approaches that have been used in Australia (including for a recent Transurban unsolicited bid in New South Wales) and internationally to transparently direct market attention to the cost expectations of project proponents (International Centre for Complex Project Management, sub. 105).

In the Commission's view, the benefits created through transparency are likely to be substantial and significant effects on bids are unlikely, provided there is effective competition in procurement.

Another possible argument against making analyses public is that governments should be free to make unconditional promises to proceed with infrastructure projects, including during election campaigns. A requirement to subsequently release a cost–benefit analysis and potentially abandon the project were this to show net costs could be seen to constrain this freedom. It could also be argued that an election promise to proceed with a project subject to a transparent cost–benefit analysis being undertaken after the election could be mistrusted by the public.

In the Commission's view the greater concern is that projects may be announced prior to being properly analysed and that this creates a momentum for them to proceed regardless of their merits. Cost–benefit analyses can be an effective tool for bringing to the public's attention projects that, while appealing to particular groups or regions, are poor value for money for the community overall. To play this role, analyses need be made public, as they frequently are in the United States and some other countries (Pew-MacArthur 2013).

RECOMMENDATION 2.3

All governments should commit to subjecting all public infrastructure investment proposals above $50 million to rigorous cost–benefit analyses that are publicly released and made available for due diligence by bidders. In general, analyses should be done prior to projects being announced. If a project is announced before analysis is done, for example, in the lead-up to an election, this should be conditional on the findings of a subsequent analysis.

A cost–benefit analysis should incorporate the best available information on the costs, benefits and risks of a project at the time it is done. However, as discussed, project selection decisions should be subject to reconsideration over time as new information becomes available. To facilitate this, and to provide the information

necessary for ex post project reviews, there is a need for records to be kept to establish a clear project history. As reported by the WA Auditor General, this is often not done at present (Office of the Auditor General Western Australia 2012). The scope for reform of governance and institutional arrangements is discussed further in chapter 7.

3 Achieving benefits from private sector involvement

Key points

- The motivation for involving the private sector in the delivery of public infrastructure should be to improve the efficiency of service provision to the community.
  - Additional efficiency gains may be achieved when private sector involvement also includes private financing. These gains can arise from the greater discipline and due diligence imposed by private financiers in the design, construction and operation of public infrastructure. This is provided that private financing effects a genuine transfer of risks to the parties best able to manage them.
- But there are potential challenges in involving the private sector, including principal-agent problems, inconsistent incentives and transaction costs associated with negotiating and contracting with private parties.
- Overcoming these challenges is difficult. There is no single approach to determining the most appropriate level of private sector involvement, or which particular procurement model to use to deliver public infrastructure services.
- Sectoral and regional differences may mean that models of private sector involvement that best serve the community's interests in one sector may not be appropriate in others.
- In principle, the choice of delivery model should be based on providing the best value for money to the community. Of course, value for money also depends on how well projects have been selected in the first place. A key determinant of value for money is risk allocation and risk management.
- Risk allocation arrangements are most efficient when risks are credibly allocated to the contractual party best able to manage and price them.
  - Expectations of bearing no or minimal risk are not conducive to effective risk allocation. Where governments have endeavoured to adopt a risk minimisation approach the costs have been higher.
- In practice, allocating risks can be complex and there may be factors that detract from the effectiveness of risk allocation arrangements. These include:
  - incentives to shift risk to other parties (including to third parties) and lack of clarity and understanding about the risks being allocated
  - implicit government guarantees, which may create perverse incentives in favour of weak risk management.
- Realising the benefits from private sector involvement rests on the presence of strong institutional and governance arrangements. In particular, governments and their agencies need to be able to understand risks and choose appropriate delivery models and contractual arrangements that appropriately and credibly allocate risks.

Governments have long played a dominant role in the construction, ownership and operation of major economic infrastructure such as roads, bridges, railways, airports, ports, telecommunication networks, and electricity and water utilities. Government involvement has been driven in part by a desire to achieve an equitable level of access to public infrastructure services. Historically in Australia, public ownership was the preferred form of regulation to deal with market failures such as natural monopoly and externalities. Governments have also provided public infrastructure because of the public good characteristics of some infrastructure, which may have resulted in under or no provision if investment was left solely to the private sector.

This is not to say that public sector delivery is the most efficient or lowest cost means of delivering public infrastructure. Indeed, there has been an increasing trend of private involvement in the delivery of public infrastructure in much of the world. This reflects a growing recognition of the potential efficiency benefits of private sector involvement compared with the alternative of public sector delivery, including stronger incentives (and scope) for the private sector to achieve lower design, construction and operating costs and to manage better the associated risks. It also reflects the development of more sophisticated regulatory tools to deal with certain types of market failures previously addressed by public ownership. Technological developments that have expanded pricing opportunities for some infrastructure have also enabled greater private sector involvement.

Australian governments generally do not undertake construction of major public infrastructure, with their construction activity now largely limited to smaller projects and maintenance. The design, construction, maintenance, and more recently the financing and operation of some infrastructure services, is bundled through public private partnerships (PPPs), although the concept of using the private sector to provide public infrastructure is not new (box 3.1). This has been partly facilitated by technological changes that have allowed wider implementation of user charging. Pro-competitive reforms (and the associated development of market-based provision of infrastructure services) and structural separation of some government-owned monopolies have also seen an increase in the proportion of public infrastructure provided by the private sector.

However, there are also significant challenges associated with governments partnering with the private sector. In particular, there can be principal–agent problems, coordination challenges across projects, and additional transaction costs associated with negotiating and contracting with private parties. These potential costs, benefits and challenges need to be analysed carefully to decide on the right level and nature of private sector involvement to achieve the best outcomes for the community. This will vary from sector to sector and project to project.

Box 3.1 **An ancient PPP contract**

There is evidence of contracts between a consortium of city-states in Lebadeia in Boeotia, Greece and private contractors for the construction of the Temple of Zeus Basileus in the fourth century BC. The contracts covered a variety of issues including deadlines, the skills and number of workmen, quality control for the various components of the project, penalties for not meeting the agreed deadlines, bonuses for exceeding the deadlines, approval of the works, dispute settlement and when the ownership of the materials would transfer from the contractor to the consortium. The Temple was not completed, likely due to significant military losses of the consortium states caught up in a war with Philip II of Macedon at the Battle of Chaeronea in 338 BC.

Source: Dr Robert Pitt, pers. comm., 4 November 2013.

This chapter outlines broad principles relevant to deciding what level of private sector involvement is likely to provide the highest net benefits to the community in the delivery of public infrastructure. A key focus of the discussion is on principles for efficiently allocating risks between the public and private sectors. Specifically, this chapter discusses:

- the various models of public infrastructure delivery (section 3.1)
- potential benefits and challenges of private sector involvement (section 3.2)
- factors to consider in selecting a delivery model (section 3.3)
- principles for efficient risk allocation (section 3.4)
- risk allocation in practice (section 3.5)
- assessing value for money under different delivery models (section 3.6).

Allocating risks is far from straightforward. Where risks are inappropriately allocated, including where either party endeavours to transfer all or a substantial amount of risk in an attempt to create certainty for themselves, then public infrastructure is likely to be delivered at a higher cost than it otherwise could have been, or may not be delivered at all. It can be very costly for a government to 'buy certainty'. The following chapters provide more detail on the consequences of risk allocation arrangements, particularly as they relate to financing (chapters 5 and 6) and tendering and contracting (chapter 12). Strong and effective governance and accountability arrangements are vital to achieving the potential benefits from private sector participation. Ways in which governance arrangements may be strengthened are considered in chapters 7 and 8.

3.1 The various models of public infrastructure delivery

There are various models of public infrastructure delivery, including traditional procurement (construction contracting, alliancing and managing contractor models), PPPs, and private provision (with or without economic regulation) (box 3.2). Further details on the types of contracting models are provided in chapter 12.

Delivery models vary in their level of private sector involvement. For example, under design and construct contracts, the government may specify the characteristics of the infrastructure to be built, and then the private sector builds the infrastructure and may assume related risks before the asset is passed onto the government to operate. By contrast, under a PPP contract, the private sector may be responsible for the design, construction, finance, operation, maintenance and commercial risks associated with the infrastructure service specified by the government. They may also own the asset before it is transferred back to the government after an agreed period (such as under a build, own, operate and transfer (BOOT contract).

Some models of private provision (and some models of public provision, such as government trading enterprises) operate in circumstances where market-determined prices or administratively determined user charges exist to fund the infrastructure service (in some cases, supplemented by 'community service obligation' payments from government) (chapter 2). These models exist for many types of infrastructure including electricity, gas, water, ports and airports. In principle, more extensive direct user charging may make it feasible to implement some elements of a corporatised government trading enterprise model to some other sectors, such as roads (chapter 8).

In these cases, the decision to invest in (and how to finance and deliver) public infrastructure can largely be left to the private party or government trading enterprise, and is driven by demand signals and policy and regulatory settings. The government's role under these models should generally be limited to setting policy (including any community service obligations) and establishing regulatory frameworks so that prices, investment, and service outcomes are as efficient as possible. This helps to militate against such factors as monopoly pricing. Occasional external review of such regulation is also essential.

The focus of this chapter is on models of delivery used in circumstances where markets do not exist or are incomplete, or cannot easily be created due to their public good features or network externalities, such as for roads and public transport. It also focuses on circumstances where public infrastructure is provided to meet the

equity obligations of government, such as hospitals and schools. In all these cases, public infrastructure can (but need not) be provided through contracts with the private sector, which may include private financing of the upfront investment costs.

Box 3.2 **Forms of public infrastructure delivery**

- **Construct only** — government retains responsibility for the design of the infrastructure and contracts with the private sector (through a tender process or other processes) to construct the facility.
- **Design and construct/maintain** — government contracts with a private party to design (based on a design brief from government) and construct an infrastructure service and may also contract with the party to maintain the facility.
- **Managing contractor** — government engages a head contractor to manage and coordinate the design and construction works on its behalf. The contractor engages third parties and typically accepts some delivery risks.
- **Alliance contracting** — government engages with one or more parties (for example, a designer and constructor) to share the risks (benefits and costs) and responsibilities of delivering an infrastructure project. An alliance contract essentially turns a project into a joint venture.
- **Public private partnership (PPP)** — there are various definitions of PPPs. For the purposes of this inquiry, a PPP is defined as a contract between the public and private sectors where a private party delivers infrastructure and associated services over the long term and where some private financing is involved. The private party is often established as a consortium using project financing through a special purpose vehicle, although the private party is not limited to this form and can be set up under a number of corporate structures, including as a subsidiary to a company (where the project is financed from the company's balance sheet), a joint venture, or a trust. PPPs may be delivered through a variety of models including where the private party designs, builds, finances and operates (DBFO) the infrastructure service, or designs, builds, finances, and maintains (DBFM) the service for a period before transferring it to government or owning it indefinitely. PPPs may be government funded through contractual payments from government (for example availability payments), directly funded through a user pays mechanism (sometimes called a concession), or a combination of the two. Other models are also used (appendix B).
- **Concession** — the government grants the right to use and invest in a public asset on the understanding or with a contract to build an unrelated (or partially related) infrastructure project.
- **Private provision (with or without regulated prices)** — a private firm selects a project and finances it from private sources. Often this is to expand or extend infrastructure previously owned by a government. The asset may or may not be subject to economic regulation.

Sources: Infrastructure Australia (2008a); Infrastructure Partnerships Australia (2007).

3.2 The potential benefits and challenges of private sector involvement in infrastructure delivery

As noted above, governments in Australia no longer undertake construction of major public infrastructure. Thus, the potential benefits and challenges of private sector involvement are appropriately viewed in the context of greater private sector involvement (for example, through PPPs and particularly involving private financing) relative to more traditional forms of delivery (such as contracting out design and construction).

Some potential benefits of private sector involvement

The benefits of private sector involvement in public infrastructure stem from the opportunity that the private sector provides to better manage the risks associated with the design, construction, maintenance and operation of public infrastructure. Where risks are appropriately allocated to the private sector, this can strengthen incentives to construct and operate infrastructure services efficiently, thereby improving the welfare of the community.

Stronger incentives to operate efficiently

The private sector is likely to have specialist expertise, for example in the area of project management for large and complex projects, and hence may be better able to deliver infrastructure projects on time and to budget.[1] Firms will often be aware, before government, of recent design and technology options that would advantage both contractor and owner if incorporated into tenders. They also have stronger incentives to reduce costs and to operate efficiently, partly driven by shareholder pressure for performance and accountability, and the incentives to pursue profit by outperforming their competitors. This is provided that risks and costs have been appropriately allocated. As an example, the Commission (2013c) noted in its inquiry into electricity network regulation that the evidence in Australia and internationally suggests private sector electricity network enterprises are more efficient than public equivalents.

Responsibility, accountability and incentives to manage infrastructure services efficiently are more diffuse within the public sector and may sometimes discourage

[1] Building infrastructure on time and within budget is not a sufficient condition to demonstrate productive efficiency as there could be significant contingency in the contract that could mask cost overruns. This is one reason why benchmarking is an appropriate tool to compare prospective projects to similar projects built elsewhere.

efficiency. For example, private contracting will require an upfront focus on the whole-of-life operating cost of the asset (25 or more years for most infrastructure). This can pose challenges to governments that traditionally work to shorter election cycles and budget horizons (around three to four years).

Bundling and contracting out the financing, design, construction, maintenance and operation of public infrastructure services (as can occur under a PPP) may deliver further efficiency benefits by creating incentives and opportunities to reduce costs over the life of the project. This is because bundling provides the private party with an incentive to tradeoff additional construction costs against reductions in future operating and maintenance costs of the service. For example, the design of a prison may affect the cost of implementing ongoing security levels (Martimort and Pouyet 2008). Similarly, the quality of a material used in the construction of a facility may have implications for the costs of maintaining the facility in later years. That said, there may be cost and quality tradeoffs to be taken into account during contracting (Hart 2003) and issues associated with reinvestment and maintenance in the final years of the contract.

Some quantitative studies have found that PPPs outperform other forms of public infrastructure procurement in terms of time and costs of construction (box 3.3). However, these studies are hampered by a lack of data and do not enable a complete comparison of the efficiency benefits of PPPs over the life of the infrastructure. As noted by the authors of one of the studies, complete comparisons are difficult as whole-of-life *ex post* performance of traditionally procured projects do not exist to the same degree as those for PPPs (Duffield, Raisbeck and Xu 2008). Establishing a counterfactual (what would have happened had the project been delivered in a different way) also complicates evaluations of the efficiency benefits of PPPs. In practice, the outcomes from PPPs in Australia have been mixed (some examples are discussed later and in appendix B). Having a capacity among government agencies and the executive to learn from these experiences is important and can be facilitated by more systematic *ex post* project evaluation (chapter 7).

Predictability and transparency of costs

Private financing of public infrastructure through a PPP may result in a more rigorous assessment of costs and explicit pricing of project risks through the due diligence and risk evaluation role undertaken by private financiers. Private financing and effective risk allocation may also help to overcome so–called 'optimism bias' associated with some public infrastructure projects (Flyvbjerg 2009; IPA 2007; Mott MacDonald International Ltd 2002).

Box 3.3 **Some reported efficiency benefits of PPPs**

Some studies have found that PPPs outperform other forms of public procurement during the construction phase of infrastructure projects. Three are discussed below.

Infrastructure Partnerships Australia (2007) examined 21 PPP projects and 33 traditionally procured projects undertaken between 2000 and 2007. PPPs were defined as a contracting arrangement in which private financing is involved. Traditional procurement methods were defined to include all non–PPP forms of contracting, including alliances, and design and construct models. It was hypothesised that PPP projects might be more likely to face time and cost overruns because contracting and financing tends to be more complex. It was found that PPPs had an average cost overrun of 1.2 per cent (from contract stage to finalisation), although this result was found to be statistically insignificant, compared with 14.8 per cent for traditional methods. PPP projects were also found to be delivered 3.4 per cent ahead of time, compared to 23 per cent behind time for traditional procurement.

A study released by the University of Melbourne examined 67 projects in Australia between 2000 and 2007 (25 PPPs and 42 traditional procurement projects). PPPs were defined as above and include design–build–finance–operate/maintain, build–own–operate–transfer and build–own–operate models. Traditional procurement was defined to be those capital projects that are financed by government through a short–term design–and–construct contract, and include design–and–build and alliance contracts. The analysis found that PPPs had an average cost overrun of 4.3 per cent post-contract execution compared to traditional projects that had an average cost overrun of 18.0 per cent. Furthermore, traditional contracts experienced greater time overrun post–contract, possibly due to uncertain contractual terms or risk allocation, or changes in contracting or government objectives (Duffield, Raisbeck and Xu 2008).

The UK National Audit Office undertook a study in 2009 in which it surveyed 114 projects across different economic and social infrastructure sectors between 2003 and 2008. The study compared Private Finance Initiative (PFI) projects to those delivered under more traditional government procurement models. The study noted that some projects may not be suitable for PFI, such as where requirements are uncertain at the outset. The results indicated that 65 per cent of PFI projects were completed to the contracted price compared with 54 per cent for non-PFI projects. Further, PFI projects were delivered to the contracted timetable in 69 per cent of cases compared to 63 per cent for non-PFI projects (NAO UK 2009a).

The UK National Audit Office (2011) later indicated that overall, the evidence of whether PFIs represent better or worse value for money than other forms of procurement was inconclusive due to insufficient data. Others have also pointed to a lack of credible data (including because many PPPs are ongoing due to their long-term nature) as a hindrance to more systematic evaluation of the efficiency benefits of PPPs (Posner, Kue Ryu and Tkachenko 2009). Drawing on a survey of international evidence in 2007, Hodge and Greve (2007) considered that the economic and financial benefits of PPPs were still subject to debate.

Optimism bias is a demonstrated systematic tendency for project appraisers to be over–optimistic about key project parameters (chapter 2). It can be argued that both public and private sectors have the potential to suffer from optimism bias. However, when private financing is involved in an infrastructure project the private party places its own funds at risk, as opposed to a government agency, which places taxpayers' money at risk. Thus, if project risk is allocated to the private party it is likely to have stronger incentives than a government agency to more accurately identify the costs and revenue streams of a proposed project (Chan et al. 2009; Flyvbjerg 2009; Yescombe 2007). This is because it will bear at least some of the financial consequences (depending on the precise allocation of project risks) of the revenue outcomes from the project, which could have considerable financial implications if significantly miscalculated.

The due diligence role played by private financiers may also add value in mitigating risk and creating incentives for better performance (Infrastructure Partnerships Australia, sub. DR186; Victorian Government, sub. 81). For example, Engel, Fischer and Galetovic (2010) suggested that banks perform a monitoring role that is well suited to mitigating moral hazard during construction of a project by exercising tight control over changes to the project's contract and to the behaviour of entities in a project-financed PPP consortium. They may do this by dispersing funds gradually as project stages are completed. During operation of the infrastructure service, private finance can also play a role in monitoring events that may significantly affect the revenues and operating costs (and hence returns) of the infrastructure service. The extent to which this occurs may depend on the structure of the business (and whether it involves project or corporate finance (chapter 5)).

These potential benefits would ideally be reflected in contracts, thus care in the design is necessary to lock-in such benefits, including the pricing and allocation of risk. Expectations that government should bear no or minimal risk are not conducive to an effective risk allocation process and are in any case unrealistic.

Competition and innovation

Although there will often be only one provider of a public infrastructure service, the contracting out of design, construction, maintenance and/or operation of infrastructure services through a competitive tender process can promote competition for the market. Competition can be an effective way of reducing costs. When designed effectively (for example, where reasonable terms and conditions of access are a key condition of selecting a preferred tenderer), competitive tender arrangements can also help to address concerns about a lack of effective competition in the provision of infrastructure services. This may obviate the need

for economic regulation when there is only one provider of the service (PC 2014a). Where duplication of infrastructure leads to the creation of an effective substitute service, this could provide a market-driven solution to a lack of effective competition through facilities-based competition.

Further, competition in the tender process can provide an opportunity for private parties to develop innovative solutions to meet service specifications of government. Of course, if there are a limited number of bidders then competition will be lessened. Issues around market structure and competition, as well as costs associated with tendering and contracting, are discussed in chapters 11 and 12.

Potential challenges of private sector involvement

Principal–agent problems

Private delivery of public infrastructure can be characterised as a principal–agent relationship, where the government is the principal (the owner of the infrastructure or the purchaser (funder) of infrastructure services) and the private party is the agent (say, a construction or operating company or a consortium under a PPP). In practice, principal–agent relationships in public infrastructure projects can be more complex than between private sector parties. For example, the government could also be thought of as the agent for the community (who can be likened to the equity holders of public infrastructure) and a public agency could be thought of as an agent for the government. There may also be principal-agent relationships within private-party PPP consortiums. For example, construction and operating companies are agents for the private-party sponsor who contracts with government.

Principal–agent arrangements typically involve asymmetric information, where a party has more information about certain risks than the other. For example, the government may not be able to determine the reasonableness of an agent's claim for costs associated with construction or operation of an infrastructure service. The agent may also pursue their own interests — for example, they may reduce costs at the expense of the quality of the service — which may run contrary to the interests of the principal (and consequently, the community).

Principal–agent problems can reduce the efficiency benefits of private involvement. The challenge for government is to select the delivery model that best addresses these problems, and importantly, enables risk to be allocated at an acceptable price in a way that aligns with each party's incentives. Also important is the design and enforceability of contractual arrangements that allocate risks between parties and the role of contestability in procurement. Contracting with the private sector for the

delivery of public infrastructure can be thought of as a repeated game, which can be influenced by the level of trust between partners.

Higher transaction costs

Some delivery models (particularly PPPs based on project financing) involve highly complex negotiation, due diligence and contractual arrangements, which contribute additional transaction costs compared to traditional public procurement. The long-term nature of some contracts may also give rise to costly renegotiations in the event that circumstances change in a way that was unforeseen at the contract formation stage or if there is disagreement about which party is responsible for a risk when it arises.

As noted by Chan et al. (2009, p. xxix):

> The costs of tendering, negotiating and managing contracts can be considerable — with tendering costs alone estimated at up to 3 per cent of the project cost.

Further, there is evidence that transaction costs are higher in Australia than in the rest of the world. For example, the Infrastructure Finance Working Group (IFWG 2012) suggested that PPP bid costs in Australia were between 25 and 45 per cent higher than in a comparable overseas market such as Canada, though lower than in the United Kingdom (KPMG 2010). Similarly, Industry Super Australia (sub. 60) submitted that Australian PPP winning tender costs were about 50 per cent higher than in Canada. One of the main reasons identified for this was the need for fully costed solutions supported by detailed information on design, construction, maintenance and financing.

Given the complexity of PPPs, governments in many countries have established specialist PPP units aimed at reducing transaction costs. In 2009, over one–half of OECD countries reported the existence of a dedicated PPP unit of some kind, and Partnerships Victoria has administered Victoria's PPP contracts since 2000 (OECD 2010).

Loss of flexibility over infrastructure services

Public infrastructure involves long timeframes and large (often sunk) capital investments, with some infrastructure, such as roads and bridges, involving physical lifespans of well over 50 years. Such assets have no (or limited) alternative use. Operating contracts may also extend for many years. Governments may want to retain flexibility to alter the design or output of infrastructure services over time in response to changes in factors such as community preferences, the development of

alternative services, severe weather events, or significant advancements in technology, which are uncertain at the outset of an infrastructure project.

It is possible to design contracts flexibly to take uncertainty into account and to allocate risk appropriately. Government could include an option to vary the contract under certain circumstances (and pay an agreed price to exercise the option). That said, contract flexibility may affect the allocation of risk and, indeed, the nature of risk. Further, it is not possible to design contracts perfectly. Contract incompleteness means that changing circumstances may necessitate *ex post* contract variations, which may be negotiated without the benefit of competition and tend to be costly. Although some flexibility in contracts is desirable, contract variations should not be used as a substitute for well-scoped initial project specifications. The use of technologies such as Building Information Modelling (chapter 12) may help to mitigate against inadequate initial specifications.

Where risks are unknown or unquantifiable, an excessively risk-averse government could pay a large premium to protect itself against a remote possibility. This can make comparisons of the costs of infrastructure between countries difficult. To the extent that Australian governments have endeavoured to shift a significant proportion of risks to the private sector, and where this has not occurred internationally, the cost of major projects in Australia would be higher.

Realising net benefits from private delivery of public infrastructure is challenging and involves complex decisions about investment and the allocation of project risks. Although PPPs may assist in improving investment efficiency, they are no guarantee that the investment decisions are appropriate or that service delivery objectives and value for money will be achieved.

3.3 Selecting a delivery model

The decision as to which model to use to deliver a public infrastructure project is independent of whether the project should proceed (Victorian Government, sub. 81), although from a timing perspective these decisions may occur concurrently or separately (IA 2008a). In practice, the cost–benefit (and possibly option) analysis used to establish the case for a public infrastructure project would also assess a range of delivery options and include value for money propositions. Moreover, decisions made at the project selection stage can sometimes have a bearing on which model of infrastructure service delivery is most appropriate. For example, a policy decision to build an untolled road (which involves an opportunity cost) would preclude the transfer of demand risk to the private party and thus preclude

the use of a PPP concession model, although it would not preclude the use of a PPP availability payment model.

There is no single approach to determining the most appropriate delivery model for public infrastructure. Sectoral differences mean that models of private sector involvement that best serve the community's interests in one sector may not be opportune in others. In principle, the choice of delivery model should be based on which model provides the best value for money to the community. Of course, value for money also depends on how well projects have been selected in the first place (chapter 2). Australian governments provide a range of guidance on the pros and cons of different delivery models and criteria to help public sector managers assess which mode of procurement is likely to deliver the best value for money (box 3.4).

Box 3.4 **Current criteria used to select a procurement option**

The National Public Private Partnership Guidelines state that in determining the appropriate delivery model, departments need to consider which model will:

- facilitate achievement or optimisation of project objectives and outcomes
- achieve the most suitable balance between the level of control the department requires and the degree of risk that is optimal to bear
- optimise the schedule, cost and quality outcomes for the project
- best suit the characteristics of the project
- provide the best value for money
- achieve the risk management objectives for the organisation and the project
- provide the most appropriate risk allocation between parties.

The guidelines also identify factors that may influence the choice of model:

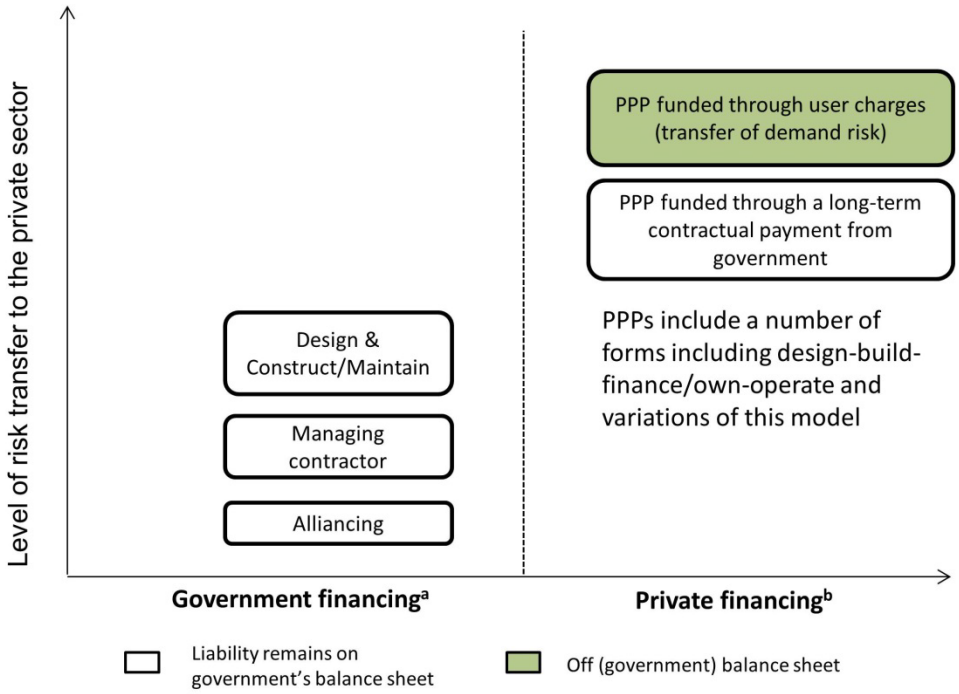
- design — the complexity of the design, scope for innovation, potential obsolescence, desire for flexibility
- capacity and capability — availability of suitable contractors and in-house resources and skills of the principal
- whole-of-life costs — merits of bundling, how to assess whole–of–life costs
- political scale — government policy and other political considerations, likely cost
- cost certainty — the need for, and degree of, strict cost control and/or certainty
- project characteristics — risk factors particular to a project, unique factors
- timing constraints — what model is likely to best accommodate time constraints.

Source: Infrastructure Australia (2008a).

A key aspect of these criteria and the assessment of value for money generally relates to the way project risks are allocated between parties. Delivery models vary

in their scope to allocate risks (figure 3.1) and should be chosen based on a consideration of the types of risks the project is likely to face in practice (IA 2008a).

Figure 3.1 **Sources of financing and risk transfer under different delivery models**



[a] Government financing can be through general budget appropriations, government borrowing, or government trading enterprises. [b] Private financing may be either corporate financing, where a private firm obtains financing for the project based on the balance sheet of the private operator, or project financing, which normally takes the form of limited–recourse lending to a specially created project vehicle known as a special purpose vehicle. Forms of financing are discussed in chapter 5.

Source: Adapted from Victorian Government (sub. 81).

Under alliance contracting, risks are shared between government and the private party. Alliances may work well in some circumstances but recent practice has been increasingly wary of the model due to uncertainty about the overall cost of construction and potential to put off rather than deal with risk issues early (chapter 12). Alliances may nevertheless still have their place. In particular, they may offer value in specific circumstances where projects must proceed out of necessity, but where substantial risk cannot be clearly allocated to one party. For example, because risks are difficult to identify and quantify or there is disagreement over the price. These examples should be rare in an effectively-planned infrastructure environment.

Traditional contracting models, such as design–and–construct or construct–only models transfer construction risk to the private party but do not transfer risk during

the operational phase. PPP models are considered by some to be an effective means of allocating a substantial proportion of project risks to the private sector (Department of Infrastructure and Regional Development, sub. 64; Office of the Infrastructure Coordinator, sub. 78; Victorian Government, sub. 81), although as discussed in the following sections, this may not always be appropriate. However, not all risks are transferred under PPPs. For example, PPPs funded using availability payments involve the public sector assuming demand risk (discussed later).

3.4 Principles for efficient risk allocation

Like all infrastructure projects, public infrastructure involves a number of risks, including those relating to design, site and construction, operation and markets, and political and regulatory conditions. Risk can be defined as any uncertain but quantifiable consequence of an activity, be it in terms of costs or benefits (OECD/ITF 2008). Some risks are project specific, such as site risk, while others are economywide (or macroeconomic), such as inflation risk (an element of market risk). For projects involving networks, a specific set of systemwide risks often apply and require detailed consideration.

Risks are not uniform over the life of an infrastructure project. Risk often peaks at the start-up phase of a project and decreases over the operating phase. The precise distribution of risk varies depending on the nature of the project. For instance, for greenfields infrastructure projects that involve significant demand risk it might be the early operations phase that presents the highest level of risk for the project.

New technologies can also affect the risks of a project. For example, the development of railways led to a reduction in the use of canals and inland water transportation. So too, the development of low–cost motor vehicles and larger and more efficient trucks were some of the reasons for a major reduction in the use of rail, as is evidenced by the significant closures of rail lines over the twentieth century.

Effective risk management minimises the economic costs and maximises the potential economic opportunities associated with risks, thereby helping to ensure that public infrastructure is delivered in a way that provides the highest value to the community. Importantly, risk cannot be eliminated, just effectively managed through measurement, allocation and mitigation.

For risk management to be effective, risks should be appropriately priced and allocated with consideration given to allocating risks in a way that creates

entitlements to the benefits as well as the costs of a materialised risk. There are a limited number of ways in which risks can be allocated (Yescombe 2007). Risks can be:

- retained by the government
- transferred to, and retained by, the private party
- transferred to the private party but then reallocated to third parties, including by passing them on to subcontractors or covering them by insurance
  - In the case of concessions (a contract granting the right to control and operate, and demand payment for the use of, an infrastructure asset), risks can be transferred to end–users through the project company having a right to impose service fees, although in some cases unpriced substitute services can limit the ability to transfer risks to end users through higher fees.

Some public infrastructure projects may be exposed to assumptions that third parties (external to the project) can facilitate the management of risk. This might be the case for projects involving networks (including for public transport, electricity and gas) where the construction and/or operation of an infrastructure service interacts with other elements of a system. For example, during the redevelopment of Southern Cross Railway Station there were construction delays that resulted in higher than expected construction costs. According to a review by the Victorian Auditor General's Office, contributing factors to the delay included stakeholder issues arising from construction activity occurring while the station remained fully operational (VAGO 2007). The influence of third parties on the delivery and operation of public infrastructure should be explicitly taken into consideration in the risk assessment and risk allocation process for public infrastructure projects. The ability of governments rather than private contractors to manage third-party risk is worthy of further consideration where infrastructure costs are of concern.

The idea that public infrastructure project risks should be clearly defined, assessed and assigned appears to be well understood by governments. For example, the National Public Private Partnership Guidelines outline principles for risk allocation and specify governments' preferred position on the allocation of a number of risks. However, as discussed later, allocating risks in practice is complex and problems have arisen in a number of cases. For example, the failure of some toll road projects, such as Sydney's cross-city tunnel and Brisbane's CLEM7 motorway (appendix B) were partly a result of overly optimistic assessments of patronage forecasts by private consultants. It can be argued that it is not governments' role at the tender selection stage to vet the risks taken by the private sector willingly. However, governments still have a role in providing information (to the extent that information is available to them) to assist in the development of an effective market.

This includes making demand forecasts and cost–benefit analyses for projects publicly available (chapter 2).

A commonly accepted principle in these guidelines, and in the literature and among participants more broadly, is that risks should be allocated to the contractual party best able to manage them (Department of Treasury and Finance (Vic) 2001; Irwin 2007; OECD/ITF 2013; Civil Contractors Federation, sub. 34; Industry Super Australia, sub. 60; Institute of Value Management, sub. DR125; Victorian Civil Construction Industry Alliance, sub. 28; attachment 2). This principle is based on the premise that the party that is in the greatest position of control of the risk, or the party that possesses the best ability to manage a particular risk, has the best opportunity to reduce the likelihood of the risk eventuating (that is, reduce the probability of the risk) or to control the consequences of the risk if it arises (that is, reduce the magnitude of the risk). That is, effective risk allocation can reduce the expected value of the risk.

It is useful to articulate some more specific principles that help to operationalise the general rule that risks should be allocated to the party best able to manage them. Irwin (2007) states that risks should be assigned, along with the responsibility to make related decisions to manage risks, so as to maximise total project value, taking into account each party's ability to:

- influence the risk factor
- influence the sensitivity of the total project value to the risk factor
- absorb the risk.

These principles are discussed below.

Ability to influence the risk factor

If one party is in a better position to influence a risk factor (the source of the risk) this party should bear the risk. For example, a construction company can influence construction-cost risk by its choice of production techniques, such as the use of a drainage system to reduce the risk of flooding on a construction site. Similarly, the party that has responsibility for the operation of an infrastructure service will be in a position to influence at least some of the operating costs of the project. In other cases, the government may have the most influence over a risk factor. For example, it may influence some aspects of site risk for a proposed road project where it mandates a particular site for a project, or by virtue of its powers of compulsory land acquisition or to expedite approval processes such as environmental approval processes (noting that there may be conflicts of interest to manage).

Ability to influence the sensitivity of the total project value to the risk factor

In some cases, neither party may be able to influence the risk factor but one party may be in a better position to influence the sensitivity of a project to a particular risk, either by anticipating or responding to the risk. This party should therefore bear the risk. For example, no one can influence the occurrence of a severe weather event but the design of an infrastructure service may reduce the damage caused by the weather event (Irwin 2007).

Ability to absorb the risk

There may be times when no one can influence, anticipate, or respond to a risk in a way that changes the project's value. At such times, the risk should be assigned to the party that can absorb it at lowest cost. It may be argued that governments are able to absorb risks at lower cost than private parties, as they can spread risk over millions of taxpayers. However, private firms are also able to spread risk among a large number of shareholders (and across countries) and thus may be able to absorb risk at a similar cost to government. As noted in chapter 6, equity holders, by being exposed to the risks on the returns of an investment have the greatest incentives to manage those risks. Further, for some risks, total project value may be influenced more if one party can influence the risk factor, or anticipate or respond to the risk if it arises, than if one party can absorb the risk at lower cost.

Other factors that may influence risk allocation

Governments and investors vary in their appetite to take on risks (as noted later with regard to greenfields projects). This can affect how risks are allocated and priced. There may be instances where one party is unwilling to take on the risks of a particular project but another party may be willing to take on the risk if it is paid sufficiently to do so. Consideration should be given to testing whether private parties are interested in bearing (and able to bear) such risks and the price required to accept them, as part of a transparent process. Governments can then assess whether the price of the private party bearing risks represents value for money to the community for the delivery of the particular infrastructure service. This continuous testing of private sector interest would also assist in improving the assessment of risks for the project and may even contribute over time to better user charging mechanisms.

Risk allocation can also be influenced by whether the right to manage or respond to the risk has been allocated. For example, if government imposes detailed yet unnecessarily prescriptive obligations on a private party relating to the design and

construction of a project, this will affect the allocation of the risk to the private party, as well as the private party's ability to make decisions about how to best manage these risks (Department of Treasury and Finance (Vic) 2001). Similarly, a party's ability to respond to a risk may be influenced by government-imposed restrictions on pass-through of costs to end users. The costs of risk transfer can also rise if governments do not behave as predicted or there are other aspects of sovereign risk which affect the project.

Transaction costs are also an important consideration in the allocation of risks. The broad categories of project risk can be subdivided into a number of more specific risks. For example, construction cost risks can be divided into risks relating to different stages of production and to the prices of different construction inputs, such as labour, materials, and services. Similarly, operating cost risks can be divided into different components, such as operation, and planned and unplanned maintenance costs. The availability and quality of materials and services used in operation present another category of risks. It may be efficient to allocate these more narrowly defined risks in different ways according to the above principles. Indeed, many contracts do this (chapter 12). However, it may be costly to analyse narrowly defined risks, to negotiate precise risk allocations, and to draft contracts that cover all possible types of risk. These costs may be significant in some cases and could offset the efficiency gains from improvements in risk allocation, particularly where the risk is not large enough to make a difference to the value of the project.

Application of the principles to some infrastructure risk areas

Applying the above principles for efficient risk allocation in practice is far from straightforward and varies from project to project. Some risks are more amenable to management or influence by one party than the other, and in other cases it is likely to be optimal to share risks between parties (table 3.1).

Allocation of construction and operating risk

As noted above, it is likely to be most efficient to allocate construction and operating risk to the party responsible for the construction and operation of an infrastructure facility. In general, these are project-specific risks about which the responsible party has private information, expertise, skills or some other strategic advantage and thus, they are likely to have the greatest ability to influence the corresponding risks. It is preferable, other things equal, for the private party to be assigned these risks. Issues associated with the allocation of construction risk are discussed further in chapter 12.

Table 3.1 **Simplified illustrative risk allocation matrix**

Phase	*Risks*	*Example risk drivers*	*Potential risk owner*	
			Private	*Government*
Design and construction	Project design	Inadequate planning, substandard design versus user requirements, lack of system integration, delayed construction permits	✓	✓
	Financing and refinancing	Cost and availability of financing and refinancing, counterparty and government-sponsored risk	✓	✓
	Construction (overruns and delays)	Equipment and raw material costs, labour costs, construction firm and subcontractor expertise, complexity of project, long-lead equipment delays	✓	
	Site	Availability of the site (land acquisition, right of way), quality of the site (geological conditions, contamination), zoning permits	✓	✓
	Environmental and social	Delayed permits, environmental constraints for construction and operation, stakeholder opposition, mitigation costs	✓	✓
Operational	Operations and maintenance costs	Labour costs, raw material inputs, poor design	✓	
	Performance	Operational efficiency, system underperformance, service interruptions, innovation risk	✓	
	Demand risk	Lower demand than forecast, poor macroeconomic conditions, price elasticity	✓	✓
Across phases	Political and regulatory	Lack of currency convertibility, changes in laws/regulations, expropriation, termination, breach of contract	✓	✓
	Foreign exchange	Fluctuations in exchange rates	✓	✓
	Force majeure	Natural or man-made events, for example, earthquakes, flood, hurricane, civil war, riot, crime, strike	✓	✓

Source: Commission analysis based on World Economic Forum (2014).

Allocation of demand risk

Demand for an infrastructure service can be highly uncertain and influenced by factors that may be beyond the control of one or both parties. In some cases,

demand risk may be outside the control of the private party and may be strongly influenced by related government policy, such as education or health policy. Another example is where demand for a proposed new road is heavily dependent on the availability and preferences of road users for competing and complementary roads in a government-planned road network. In this case, the private party may have little or no control over the level of demand for the road.

This may suggest that governments bear demand risk for the proposed road. For example, they may choose to make payments to the private company that are independent of demand for the road (Engel, Fischer and Galetovic 2010; Irwin 2007; OECD/ITF 2013). An example of this appears to be the East West link procurement strategy in Victoria (Victorian Government, sub. 81). Chapter 6 discusses the use of availability payments as a potential mechanism to encourage private financing of public infrastructure projects.

Generally speaking, where public infrastructure that is of value to the community cannot be funded solely through user charges, it may be appropriate for government to either consider bearing demand risk through payments to the operator, for example funded by non-user charges (that is, taxes), or fund the project itself.

The value for money of using private financing and payments to the operator, at potentially higher cost, must be found in the quality and efficient delivery of infrastructure services. Greater experience with the use of such payment mechanisms may provide a clearer indication of whether the approach provides the highest net benefit to the community. Further, and as noted above, consideration should also be given to the private sector's willingness to price and accept risks for such projects as part of a transparent process.

There may also be situations where a government wishes to retain flexibility to use an infrastructure service in various ways. For example, a government agency may choose to outsource the construction and operation of a water desalination plant, but may wish to reserve the right to decide when water is drawn from the plant as part of its efficient management of a portfolio of water supply options in the presence of rainfall variability (box 3.5). In this case, the private operator has limited influence over demand for the service. This may suggest that governments bear demand risk for the service and could do so through, for example, capacity payments and use of service payments to the plant operator. An example in the energy sector is the use of power purchase agreements by governments wishing to secure energy supply.

In other circumstances, it may be appropriate for the private party to bear demand risk. For example, where there is a strong existing market for the service that

provides a clear signal about the level and stability of demand (as in mature electricity or airport sectors (Delmon 2009; IA 2008b)).

Box 3.5 **Sydney Desalination Plant**

The Sydney Desalination Plant (SDP) was constructed as part of the NSW Government's Metropolitan Water Plan. Under the current plan, SDP's role is to help 'drought proof' the greater Sydney area by providing a source of non-rainfall dependent drinking water that can be drawn on when available dam storage levels fall below a specified threshold. The current plan outlines SDP's operating regime, which includes commencing production of treated water when Sydney's available dam storage level falls to 70 per cent, and continuing until that level reaches 80 per cent.

Sydney Water and SDP have entered into a non-exclusive 30-year water supply agreement requiring that Sydney Water will:

- take delivery of all water produced by the plant that SDP does not sell to other parties, provided the water meets the Australian Drinking Water Guidelines
- pay the price determined by the Independent Pricing and Regulatory Tribunal for all water that is sold to it while the plant is operating in accordance with the Metropolitan Water Plan.

Source: IPART (2011).

Risk allocation in greenfields projects

Greenfields infrastructure involves construction of new assets (which may require land acquisition and environmental and planning approvals) for which there is no pre-existing demand for the service. Greenfields projects can also involve high construction-cost risk and if the project fails there is no or limited alternative use for the asset. Demand risk is high as there is little data available to assess patronage risk and the like. By contrast, brownfields projects involve assets for which demand for the service already exists and is well understood but where the assets may be in need of improvement, refurbishment or expansion. In practice, however, some infrastructure may have both greenfields and brownfields elements, for example when new infrastructure is built within an existing network. The extent to which construction-cost risk may be higher or lower for greenfields projects compared with brownfields projects will depend on the specific project.

Some participants pointed to greenfields risk, or more specifically patronage (demand) risk for new toll road projects, as a potential impediment to private sector financing of public infrastructure (BCA, sub. 39, attach; Bianchi and Drew, sub. 33; Department of Infrastructure and Regional Development, sub. 64; Katz, sub. 45; Lend Lease, sub. 46; Smart Infrastructure Facility, sub. 94; Victorian Government,

sub. 81). In contrast, Transurban (sub. 61) considered that there remains private sector appetite to take on patronage risk among those with a longer investment horizon.

The principles for risk allocation outlined above can be applied to the consideration of greenfields infrastructure projects. Where demand risk for greenfields projects is inappropriately transferred to the private sector this may present an impediment to private sector participation. For example, in cases where demand for the service is heavily dependent on related government policy or network effects outside the influence of the private party. Alternatively, it may be reflected in a large risk premium demanded by private parties for the assumption of the risk.

Several approaches have been raised by participants to implement risk sharing arrangements for infrastructure that involves greenfields risk, including availability payments, infrastructure bonds, government loans and guarantees (chapter 6). In considering these risk sharing proposals, it is important to note that approaches that transfer greenfields risks to the public sector do not eliminate them, they simply transfer them to the community. Thus, as noted by Ergas (sub. 87), the same factors that lead private investors to be risk averse in response to major new project proposals with substantial cost and demand uncertainty should lead the public sector to also be wary of those projects.

Allocation of government policy risk

Government policy risk can be specific to a particular project and/or relate to sector specific or economywide policies, for example corporate income tax or environmental policy. Where a government policy is sector specific or economywide, it is generally not appropriate for infrastructure projects to reallocate such risks. Although governments can influence sector specific and economywide policy, designing policy to suit particular infrastructure projects can distort these policies and the economy more broadly. All businesses should bear these risks in the same way.

In practice, the willingness of a private party to take on government policy risk is likely to depend on the extent to which potential cost increases from a change in policy can be passed on. This will be influenced by whether there are regulatory restrictions on price increases, the sensitivity of demand to the price of the service, and competition from similar services. It may also depend on whether the private operator has a direct commercial relationship with end users. Where the private party is unable to pass through potential costs from future policy changes, the government and the private party may choose to negotiate a method of funding the cost increase, with the arrangements clearly set out in contracts.

Consequences of inefficient risk allocation

When risks are inappropriately transferred to the private sector then unnecessarily high premiums could be charged to deliver public infrastructure services, thereby undermining or even reversing the potential benefits of private sector involvement and value for money to the community. The transfer of risks can also affect behaviour in future negotiations for public infrastructure projects. For example, participants have suggested that the failure of private sector companies in some previous toll road projects has led to an unwillingness of private parties to take on patronage risk in subsequent projects. That said, past failures of investment projects have rarely discouraged investment over the long-term and lessons learned from failed projects can inform future projects (chapter 6).

There may be circumstances where private investors are unwilling to take on certain risks (and therefore projects), particularly those projects that do not have an adequate revenue stream to make the investment commercially attractive. In these cases, governments should also be cautious about investing in the project and should do so only where a rigorous and transparent cost–benefit assessment indicates that the project would provide net benefits to the community.

Risks that are inappropriately transferred to government are ultimately borne by the community when they arise, either through increased taxes or government debt, or a reduction in other public services. Inappropriate assignment of risks can also result in costly contract renegotiations, which can generate strategic behaviour and reduce incentives for efficient management of infrastructure services.

3.5 Risk allocation in practice

In practice, the assignment of risks is complex and may be influenced by a range of factors that could detract from the efficiency of risk allocation arrangements, and in turn the chosen model of delivery. These factors include:

- government policy settings — as noted above, for example, pricing decisions can affect the allocation of demand risk to the private sector
- attitudes to risks and incentives to shift risks between parties
- capability of public sector agencies
- government guarantees, which can distort risk management incentives
- lack of relevant information.

Attitudes to risk and incentives to shift risks between parties

Some inquiry participants raised issues relating to risk allocation that appear to relate to attitudes to, and understanding of, risk. For example, Sinclair Knight Merz (sub. 108) suggested that the focus and backgrounds of people leading and participating in risk assessment biases the scope and perception of risk. Lend Lease (sub. 46) suggested that it is common practice for state governments to seek to vary established risk transfers based on the differing views of transaction managers and Treasury representatives involved in the development of project briefs. The Council of Capital City Lord Mayors (sub. 73) noted that government agencies tend to try and transfer as much project risk as possible to the private sector, which leads to higher project costs, as contractors price to allow for risk.

Private parties (for example, PPP consortia) could also have an incentive to shift risks within their group, particularly if the PPP suffers from internal agency problems (Martimort and Pouyet 2008). Lean Construction Institute of Australia (sub. 103) noted that risk is often contractually passed down to a level where it cannot be effectively managed or mitigated. Despite construction, operation and maintenance being bundled in a PPP (and associated risks transferred to the PPP), a conflict could also arise from the fact that each subcontractor may only be interested in a limited aspect of the project and thus, they may have a reduced incentive to manage risks that sit outside their area of interest. These outcomes may be representative of the principal-agent and asymmetric information problems discussed earlier in this chapter that are inherent in PPP approaches.

The University of New South Wales (sub. 44) suggested that PPPs are partnerships in name only and that a risk-transfer culture often results in the inappropriate transfer of risk. This results in higher costs and increased likelihood of project failure as risks are passed down the contract chain to subcontractors that cannot manage them. Repeat contracts can help to resolve such potential issues. A partnership is only likely to persist where both partners view the arrangement as valuable.

Capability of public sector agencies

Some of these issues could be linked to the capabilities of public sector agencies and their understanding of project risks. For example, Consult Australia (sub. 23, p. 6) suggested that risk is often inadequately addressed due to cultural issues within an agency, 'including that a particular approach is how things might have always been done previously, with new approaches to the benefit of the client resisted within that organisation'. Consult Australia also suggested that it is

common practice for public sector agencies to offer contracts where all risk is transferred to other parties irrespective of who is best able to manage that risk, with contracts being offered on a 'take it or leave it' basis. One reason offered for such outcomes is that the relevant officers of the procuring agency are not fully aware of the ramifications of their actions (Consult Australia, sub. 23). Other possible reasons could be risk aversion of government officials or excessive probity requirements.

More broadly, a number of participants pointed to the availability of procurement and project management skills within government agencies as an impediment to the efficient delivery of, and value for money provided by, public infrastructure projects (Consult Australia, sub. 23 and DR168; Lend Lease, sub. 46; Smart Infrastructure Facility, sub. 94; University of New South Wales, sub. 44). On the other hand, the Local Government Association of Queensland (sub. DR143) suggested that the specialist skills required to manage infrastructure projects can be provided to governments by external service providers. The availability of project management and procurement skills is discussed further in chapter 12.

Government guarantees and step-in

Even where risk has been contractually allocated, there can remain a residual risk that government may have to step in if a private party experiences difficulty meeting its obligations (ANAO 2003a). For instance, governments may come under pressure to extend construction timelines or provide compensation for cost overruns to avoid failure of important infrastructure projects and/or continuity of services (Yescombe 2007). As governments are largely responsible for the creation of public infrastructure they are typically expected to step in and take over when projects fail (OECD/ITF 2008).

The Office of the Infrastructure Coordinator (sub. 78, p. 15) suggested that governments have not had a good track record of enforcing risk allocation of design and construct contracts and that 'much of the necessary commercial expertise does not currently exist in the public sector to analyse and negotiate complex infrastructure transactions'. Similar issues were outlined by the Victorian Public Accounts and Estimates Committee in its 2006 report on private investment in public infrastructure (Parliament of Victoria 2006). Industry Super Australia (sub. 60) also noted that there are instances where risks are unquantifiable and while they have notionally been transferred to the private sector, in reality they continue to reside with government. Some examples of the above types of outcome are provided in box 3.6.

Box 3.6 **Examples of risk allocation in public infrastructure projects**

There have been instances where governments have in the past assumed risks and incurred costs associated with public infrastructure projects that have not performed well.

The Build-Own-Operate model for the Latrobe Regional Hospital in Victoria transferred a significant proportion of the financial risks to the private party. However, substantial operating losses within a year of operations, stemming from the low initial bid price and the inability of the private sector consortia to make efficiency gains originally assumed, resulted in the step-in provisions in the contract being exercised. The operation of the hospital was transferred to the public sector in early 2002 as the social responsibilities of the Victorian Government meant that any threat to public health and safety or hospital service provision could not be allowed to occur. The final outcome was that the private operator was able to avoid the full financial risk obligations embodied under the contractual arrangements (VAGO 2002).

The NSW Government bore substantial financial costs from the Sydney Airport Rail Link (also called the New Southern Railway project) after the company that built and operated the link (under a 30-year leasehold build-own-operate-transfer arrangement) failed to meet scheduled payments to creditors due to passenger numbers being lower than expected (Department of the Parliamentary Library 2002; IA 2008e). The NSW Government spent $800 million to extract itself from the contract that stipulated 48 000 passengers per day and bound it to making up shortfalls in revenue below forecast levels (IA 2008e).

The NSW Government agreed in early 2012 to provide conditional deferred equity of $175 million to the Waratah Train PPP project, if required, to overcome concerns regarding the private partner's ability to refinance its debt in 2018 (Audit Office of New South Wales 2012; Clayton Utz 2013).

Similar situations have arisen internationally. For example, in the UK, the Government sought to transfer construction risk to the private sector under the Channel Tunnel Rail Link Project (otherwise known as High Speed 1). However, the UK Government ended up bearing some of the construction risks in the second refinanced stage of the project as part of the Cost Overrun Protection Program (appendix B).

During the construction phase, all parties should have an interest in seeing an asset created. However, where governments have allocated risks to the private party in an enforceable contract, they should be strongly predisposed not to support struggling projects (that is, for government to create a credible pre-commitment to not support the project). To the extent that governments support struggling projects where risk has been allocated to the private sector, they create moral hazard risks for future projects. Guarding against this risk is more easily managed in the operational phase, where receivership arrangements have tended to work well and experience with formal step-in rights is improving. Additionally, if a government considers it

necessary to support a struggling project, it may want to consider taking back responsibility for the infrastructure rather than subsidising the private operator.

Should government assistance for struggling public infrastructure projects be considered, it should be guided by the alternative costs. These costs include those associated with renegotiating or retendering for the project. Where it is apparent that these costs exceed the costs of intervention, it may be appropriate to consider assistance to the contractor. Any government support of this nature amounts to an implicit government guarantee, and changes expectations of such implicit guarantees in the future. Such a guarantee could also cause moral hazard if it affects the private party's incentive to manage risks and to undertake construction and operation efficiently.

3.6 Assessing value for money under different delivery models

Generally speaking, a PPP may provide value for money compared to other forms of procurement if the advantages of risk transfer combined with private sector incentives, experience and innovation in improved service delivery outweigh the increased costs of contracting and financing. This raises the question of how to assess the value for money of different delivery options (World Bank 2013).

Ex ante value for money assessments

In practice in Australia, *ex ante* value for money assessments are often carried out using a public sector comparator. The public sector comparator consists of an estimate of the cost the government would pay were it to deliver a service using the most efficient form of standard public procurement (this form of procurement does not have to assume that the services will be undertaken by the public sector). This cost is then compared to an estimate of the cost of delivering the service using a PPP (box 3.7). The National Public Private Partnership Guidelines require preliminary analysis of a public sector comparator to be included in the interim business case when a PPP is being considered to deliver public infrastructure (IA 2012b).

Value for money assessments are also required for public infrastructure projects procured via non-PPP contracting methods (in accordance with the Australian Government's procurement rules), but these do not require a public sector comparator approach to be used. Rather, the intention is to establish value for money from procurement using cost–benefit analyses. Similar arrangements exist at

the state and territory level. For example, the NSW Government's procurement policy guidelines require a statement of value for money in relation to the procurement of goods and services (NSW Government 2013b).

Box 3.7 **Public sector comparator**

The purpose of the public sector comparator is to provide governments with a quantitative benchmark of the value for money it can expect from accepting a private sector proposal to deliver a project using a PPP. It is an estimate of the most efficient public procurement cost (including all capital and operating costs and share of overheads) after adjustments for:

- the value of risks transferred to the private sector
- the value of risk retained by the public sector
- competitive neutrality (removal of any net advantages or disadvantages that accrue to a government business by virtue of government ownership).

The most efficient public procurement method is the one that satisfies all elements of the output specification if the project were to proceed on a traditionally funded basis and does not have to assume that all services will be undertaken by the public sector.

The public sector comparator is calculated as the net present cost of a projected cash flow to government of providing the output over the life of the project.

Source: Infrastructure Australia (2008c).

In principle, the use of a cost benchmark such as the public sector comparator can be an appropriate way to assess the value for money of delivering public infrastructure through a PPP. Indeed, the private sector similarly uses cost benchmarks to assess the value for money of bids to construct significant infrastructure (box 3.8). In practice however, developing a public sector comparator can be problematic and the usefulness of the approach has been the subject of debate both in Australia and internationally (for example, Parliament of Victoria 2006; World Bank 2013). Identified limitations include a shortage of relevant data and results that are highly sensitive to assumptions about the discount rate used and to the methodologies applied for valuing risk transfer to the private sector.

The Victorian Government announced changes to the role of the public sector comparator in 2013. There will no longer be an assumption that should the public sector comparator cost expectation not be met through a competitive process that the Government will use the comparator as the basis to revert to traditional design and construct delivery. In addition, the Victorian Government has introduced the use of a 'scope ladder' to be used alongside the public sector comparator. The purpose of the scope ladder is to identify any scope items bidders can either remove

or add should bids be over or under the public sector comparator, to allow tenderers to compete on scope as well as price (Department of Treasury and Finance (Vic) 2013; Victorian Government, sub DR. 196).

Few inquiry participants commented on the use of a public sector comparator. Lend Lease suggested that:

> [t]he comparison of public and private delivery of public infrastructure assets quite often involves the development of a Public Sector Comparator with accompanying risk margins/discount rates. These are invariably shrouded in secrecy with little detail available as to how they are built up and arrived at. The lack of transparency and information on how these are determined from project to project makes it difficult to comment on the tools being used by governments to make threshold decisions as to whether projects should be funded via traditional methods or via the use of private sector finance. (sub. 46, p. 16)

Hodge (sub. DR151, p. 3) referred to the public sector comparator as a tool highly capable of being manipulated and suggested that 'the inherent flexibility of the public sector comparator is another advertisement for maximising transparency of calculations, base data and assumptions'.

Box 3.8 **The use of benchmarking at Melbourne Airport**

Melbourne Airport is currently in the process of developing a new domestic terminal in the southern precinct of the airport (known as the Southern Precinct Program). The first phase of the project is expected to be completed in the second half of 2015 and will include a new domestic terminal building, 17 new aircraft parking bays and new taxi lanes, ground transport facilities and improvements in the airport's road network (Melbourne Airport 2014). While concurrently seeking private sector tenders for construction of the facility, Melbourne Airport obtained advice from an independent consulting firm on the estimated cost of construction. This process was used as part of the overall due diligence process in assessing the value for money of bids from a limited number of tenderers.

The costs of developing a public sector comparator may exceed the value they offer to projects where an equivalent process has been attempted before for a similar project. Further, as noted in chapters 2 and 7, proposed infrastructure projects should be subject to rigorous and transparent cost–benefit analysis. In principle, such analysis should provide much of the necessary information on the expected capital and operating costs of the proposed project to inform the benchmarking of private sector bids.

A public sector comparator is likely to be most useful when it is published in substantial detail accompanying the announcement of a tender process, particularly

where a new area of potential private investment, or a novel process, such as an inverted bid or similar process is being trialled (chapter 6).

Ex post value for money assessments

An important part of any consideration of value for money of public infrastructure includes appropriate *ex post* evaluation. As discussed in chapter 2, *ex ante* assessments of costs and benefits of infrastructure projects are often quite different from actual costs and benefits. Moreover, as noted earlier, although some studies have been undertaken to assess the performance of PPPs as a method of public infrastructure delivery, complete comparisons are difficult due to limited evidence of the whole-of-life *ex post* performance of traditionally procured projects and difficulties establishing a counterfactual. Nonetheless, *ex post* evaluation is important as a means of holding decision makers accountable for outcomes and for providing information and lessons that can contribute to the development of future public infrastructure projects.

Chapters 7 and 8 outline the Commission's approach to strengthening governance arrangements for public infrastructure. This includes principles relating to the use of effective cost–benefit analysis and transparency of assessments, including the methodology and assumptions used, and *ex post* evaluation of public infrastructure projects.

4 Funding mechanisms

Key points

- In essence, the funds to pay for public infrastructure ultimately have to come either from users and other beneficiaries, or from governments.
- Direct user charges (prices) should be the default option because they can provide an incentive for efficient provision and use of infrastructure. They are already the norm for most types of economic infrastructure, apart from roads and public transport.
  - For heavy road vehicles, a reformed system of direct pricing has been under development to more clearly signal costs to users and indicate where road providers should invest in new capacity.
  - For cars and other light vehicles, governments should undertake pilot studies of (revenue neutral) direct road user pricing using vehicle telematics.
  - Public transport would generally be undersupplied if it had to be primarily funded by user prices. Some government subsidy is appropriate, given the wider benefits it generates and equity goals it meets.
- Road user pricing reform requires consideration of many difficult issues, and it will be challenging to gain community acceptance for change. However, there are signs that reform is possible, including because:
  - motorist associations recently signalled a shift to supporting consideration of more direct user pricing as part of comprehensive road funding reform
  - the current funding model's high reliance on fuel excise does not appear to be sustainable, despite the imminent return to indexation, because growth in net excise revenue is likely to continue to lag behind changes in road use and costs.
- When the benefits from infrastructure accrue to more than users, governments should also consider value-capture initiatives — such as betterment levies and property development — so that wider beneficiaries contribute to funding.
- Governments will have to continue to at least partly fund some infrastructure.
  - This can be warranted when it is impractical to exclude users who do not pay direct prices, wider beneficiaries are difficult to identify or very diffuse, and/or infrastructure is provided to meet equity goals.
  - The above reasons are why a mix of government funding and direct pricing appears likely to remain appropriate for some roads, public transport and social infrastructure.
- Government funding should generally be sourced from broad-based taxes on income, consumption or land because such taxes have lower efficiency costs. The Australian Government levies the greater part of these more efficient taxes, requiring it to play a major role in funding infrastructure spending by the States and Territories.

In essence, the funds to pay for public infrastructure ultimately have to come from those who benefit from it (through direct charges on users and other beneficiaries) or from the wider community through their governments (using taxation and other sources of public revenue).[2]

Many inquiry participants argued for greater use of direct charges on users and other beneficiaries, given that governments are reluctant to fund worthwhile new projects due to their fiscal consolidation goals. Greater reliance on direct charges could also be justified on efficiency and equity grounds, as discussed below.

Nevertheless, there will continue to be a role for governments to at least partly fund some types of public infrastructure, particularly where it is impractical to directly charge the beneficiaries or it is provided on equity grounds.

This chapter reviews the various mechanisms to fund public infrastructure, how they are currently used, and considers what reforms are warranted to encourage a more efficient mix of funding approaches. Specifically, the chapter examines:

- user charges (section 4.1)
- value-capture approaches (section 4.2)
- developer contributions (section 4.3)
- government funding (section 4.4).

4.1 User charges

In principle, user charges (prices) based on the (efficient) cost of provision should be the default option for funding infrastructure. By giving individuals a clear signal about the cost of infrastructure, they will have an incentive to use it efficiently. Moreover, there will be a signal to infrastructure providers about where changes in infrastructure capacity are warranted. User charging can also address equity concerns that would otherwise arise because the primary beneficiaries of infrastructure are not the ones who pay for it.

User charging is already the norm for most types of economic infrastructure. Such charging is sometimes subject to a form of government oversight because the

[2] Philanthropy is another potential funding source but this is unlikely to ever fund more than a small fraction of Australia's total infrastructure spending, and is more prevalent in social infrastructure such as museums. It is also possible for private investors to unintentionally fund public infrastructure if it is a commercial failure (by losing the equity or debt they provided to finance the project). But this is obviously not a sustainable funding model and so is not discussed further.

infrastructure has characteristics that make it prone to being priced well above cost. The type of oversight varies between industries and jurisdictions (box 4.1).

Box 4.1 **Government oversight of user charges**

Economic infrastructure sometimes has characteristics that make it a 'natural monopoly'. That is, it is less costly for demand to be satisfied by a single piece of infrastructure, rather than have two or more suppliers compete by duplicating it. This creates an opportunity for a single infrastructure owner to maximise profits by pricing its services well above cost. Governments often respond to this possibility by establishing a form of oversight for the prices charged for infrastructure services.

Such oversight can take the form of price monitoring, with an implicit threat that monopolistic pricing could prompt some form of corrective action. Infrastructure-related services subject to price monitoring include:

- Australia's four largest airports (Sydney, Melbourne, Brisbane and Perth)
- retail electricity in Victoria and South Australia
- retail gas in all jurisdictions except New South Wales
- ports in New South Wales, Victoria and South Australia.

A more prescriptive approach is to regulate prices. This typically involves an economic regulator, which determines the total revenue (revenue requirement) a supplier is entitled to receive to cover costs, and then translates this into a set of prices for customers. Examples of this approach include:

- energy networks (electricity poles/wires and gas pipelines)
- retail electricity in all jurisdictions except Victoria and South Australia
- retail gas in New South Wales
- a range of Telstra's fixed-line voice services.

Governments can also have a role in overseeing the prices charged for infrastructure services under an access regime. Such regimes have been created so that businesses can access on commercial terms the services provided by a piece of infrastructure that would not be efficient to duplicate. Specific access regimes exist for a range of infrastructure, including below-track rail (national and state-based regimes), ports (Queensland and South Australia) and telecommunications (national).

A key question for government oversight of user charges is what form of pricing leads to the most efficient provision and use of infrastructure. In its simplest form, economic theory suggests that prices should be set equal to a supplier's short-run marginal cost (SRMC) (the cost of supplying an additional unit of output without investing in new capacity). Assuming that there are competitive markets, no market distortions, and that average costs do not fall as the quantity supplied rises, SRMC pricing will (just) recover a supplier's total costs over time, so that the supplier will make a 'normal' profit on the capital invested.

However, infrastructure often involves substantial and lumpy investments that lead to economies of scale over a wide range of output. This means that a supplier's average cost can fall as the quantity supplied increases. In such circumstances, SRMC pricing (for all units sold) will generally not provide an adequate return on existing assets and, of greater relevance for economic efficiency, would not provide an adequate incentive for infrastructure providers to undertake efficient investment over time.

The challenge is to identify a pricing approach that recovers the (efficient) cost of providing infrastructure services, while not significantly impeding the efficient use of infrastructure at the margin. There are various options — such as average cost pricing and multi-part pricing — each of which has pros and cons (PC 2006b).

There can be many other challenges in designing a form of government oversight, such as what should be the most appropriate institutional arrangements and what aspects in addition to prices (for example, service standards) should be subject to oversight. The difficult issues that governments can face have been evident in past inquiries that the Commission has conducted on specific infrastructure, including for airport services, electricity networks and urban water (PC 2011a, 2012c, 2013c). Nevertheless, the general concept of user charging is widely accepted as being appropriate for such infrastructure.

The issue for this inquiry is whether user charging should be used more extensively in areas where it is currently rare or applied in a very partial or indirect way. As far as economic infrastructure is concerned, that is primarily a question for land transport, particularly where it involves the use of cars, other light vehicles and public transport. Accordingly, land transport is the focus of the remainder of this section of the chapter.

The Office of the Infrastructure Coordinator noted that the issues are most acute for roads.

> By far the largest infrastructure charging or pricing challenge is for roads. Much more is spent on transport each year than on other infrastructure facilities, and road spending is the largest element within transport. (sub. 78, p. 5)

Direct user charging is also limited in the case of social infrastructure. Such infrastructure is primarily funded by governments on the basis that it has strong public good characteristics and/or is provided to meet equity goals. Whether this funding model should be used so extensively for social infrastructure is considered as part of the discussion of government funding later in the chapter.

Road user charging

Road users and motoring associations often express the view that motorists already pay for a large part of, if not all, the infrastructure they use through measures such as registration charges and fuel taxes. This is a contentious claim because much of the revenue comes from taxes — particularly fuel excise — which strictly speaking are not a fee-for-service. However, as discussed below, the disconnect between road-related revenue and expenditure explains much of the inefficiency in road provision, and so is relevant to this inquiry.

The BITRE (2013a) estimated that, in 2011-12, total road expenditure by all levels of government amounted to $19.5 billion.[3] In comparison, the revenue collected by governments from fuel excise, registration charges, driver's licence fees and stamp duty amounted to $16.5 billion. However, this excludes some significant revenues, including from road tolls and the luxury car tax, as well as general taxation not specifically directed at motor vehicles or their use, such as the fringe benefits tax and goods and services tax. Estimates made by the BITRE (2011) for earlier years suggest that the excluded taxes and charges would have totalled billions of dollars in 2011-12. On this basis, some would argue that the disconnect between road-related revenue and expenditure has not led to an under-recovery of costs from motorists.

Whatever the balance between revenue and expenditure, it is clear that road-related taxes and charges do not provide a clear signal to use and provide roads efficiently. The taxes and charges that individual road users pay are often only loosely related to the cost of the specific roads they use, when the roads are used, and the distances travelled. Moreover, the revenue raised from road users does not generally go directly to the organisations that supply roads, or it is hypothecated to road authorities in ways that do not provide a clear incentive to supply services to the users that generate revenue. Hence, road-related taxes and charges do not perform the function that prices do in other markets in clearly signalling to users the cost of provision, and to suppliers where capacity changes are warranted.

The limitations of not having a clear price signal for road use have been recognised for many years, but it has proved very challenging to address this. The greatest progress has been made with charging heavy vehicles, but even there the issue is not addressed effectively, and further reform has been under development.

[3] This includes work done by the private sector for governments. It excludes expenditure not recorded in government accounts, such as toll roads constructed and operated by the private sector.

Heavy vehicle charges

There is a common system of cost-reflective user charges for heavy vehicles across all jurisdictions except Western Australia and the Northern Territory.[4] This was introduced in 1992 to help recover the cost of road wear and tear attributable to heavy vehicles, and a share of common costs that benefit all road users, such as street lighting and signage. The charges are currently set by the COAG Transport and Infrastructure Council (TIC), based on advice from the National Transport Commission (NTC) (box 4.2).

Box 4.2 **The current system of heavy vehicle charging**

Vehicles with a gross vehicle mass of more than 4.5 tonnes are subject to a common charging regime in all jurisdictions except Western Australia and the Northern Territory. Charges are recommended by the National Transport Commission (NTC) and decided by vote of the COAG Transport and Infrastructure Council (TIC), which comprises transport ministers from all jurisdictions. The regime was introduced in 1992 to help recover the attributable costs of road wear for each heavy vehicle type; recover a share of common road costs that benefit all road users (such as street lighting and signage); and ensure heavy vehicles pay their share of road spending.

The NTC calculates charges in accordance with model legislation (the Model Heavy Vehicle Charges Act) that is implemented in each jurisdiction, and principles set by the TIC and COAG. The principles are full recovery of allocated infrastructure costs, while minimising both the over and under recovery from any class of vehicle; cost effectiveness of pricing instruments; transparency; a balance of administrative simplicity, efficiency and equity; having regard to other pricing applications, such as light vehicle charges, tolling and congestion; on-going cost recovery in aggregate; and the removal of cross subsidies between vehicle classes.

A pay-as-you-go (PAYGO) approach is used to calculate the level of costs to recover. Specifically, heavy vehicle charges are based on annual road expenditure, averaged over seven years. The averaging is intended to avoid significant variability in charges due to short-term changes in spending. An annual adjustment formula is automatically applied in July each year to ensure the charges keep pace with road spending.

Charges are imposed as a fixed annual registration charge that varies by vehicle type and is collected by State and Territory Governments, and a fuel-based road user charge (RUC) collected by the Commonwealth. Around 40 per cent of revenue is raised from registration fees, with the balance from the RUC.

The RUC is administered through the diesel excise arrangements. The rate of diesel excise (38.143 cents/litre) is currently above the RUC (26.14 cents/litre), and so vehicle operators can claim a rebate (12.003 cents/litre).

4 Western Australia and the Northern Territory have not implemented the charging regime due to concerns that it would have a disproportionately negative impact on those jurisdictions because of their greater reliance on the largest types of vehicles (Marsden Jacob Associates 2013).

However, the existing approach to heavy vehicle charging has some deficiencies. This was detailed in a 2006 review by the Productivity Commission, which found that inefficient road use was occurring because charges were based on costs averaged across the road network and for given vehicle classes (PC 2006b). The Commission also found that there were inefficiencies in road provision due to a disconnect between the revenue raised and spending decisions of road providers.

Similar concerns were expressed by participants in this inquiry.

> … while local governments receive grants that are notionally for road spending the grants are not tied and the money industry pays does not necessarily end up being spent on heavy vehicle infrastructure. This lack of accountability and control over money provided by the industry needs to be rectified. (Australian Trucking Association, sub. 27, p. 4)

> There is no direct link between the revenue collected from [heavy vehicle] road users and expenditure on road infrastructure … Funding allocations for road infrastructure are typically the result of decisions by government Ministers, and these are often made as part of the annual budget process. While many road funding decisions are supported by economic analysis, there is no connection between revenue generated, or expected to be generated in the future, and expenditure. (Asciano, Aurizon, Australian Rail Track Corporation and Australasian Railway Association, sub. 56, p. 4)

In 2006, the Commission recommended a phased reform program that would, subject to further research and trials, ultimately lead to location-based charges for heavy vehicles. Institutional reforms — such as the establishment of independent road funds — were also recommended to link charges revenue to spending.

In response, the COAG Road Reform Plan was established in 2007 to conduct research and trials on more efficient charging. Its final report supported the development of an integrated package of pricing, funding and expenditure reforms (CRRP 2011). This task was assigned to the Heavy Vehicle Charging and Investment (HVCI) reform project, with its activities overseen by a board of senior officials from the three tiers of government and the freight industry.

The HVCI reform project, which is scheduled to cease operations in June 2014, has been developing the details of its proposed reforms. Various charging options had been considered, including a national fuel-based charge and a state-specific mass-distance-location charge. Associated institutional reforms were also being considered so that there would be 'a market-based framework for the provision and use of road services, similar to the approach used for utilities and other network natural monopolies' (HVCI, sub. 77, p. 7). Potential institutional models for roads, including the approach developed by the HVCI reform project, are examined in chapter 8.

The Australian Logistics Council (ALC) supported the HVCI reform project, provided it led to a connection between revenue collection and expenditure, but was concerned that implementation could be years away.

> ALC … supports the introduction of some form of mass-distance-location charging of vehicles … so long as such funds that are collected are actually invested in the infrastructure used by the vehicle (that is, the revenue 'follows the freight') and not diverted into consolidated revenue for use for other purposes and that any payments made to a road owner in the form of a CSO [community service obligation] payment is transparent … Whilst ALC supports the general direction that the HVCI is going, it is somewhat concerned at the speed at which it is proceeding. (sub. 48, pp. 4–5)

Asciano, Aurizon, Australian Rail Track Corporation and Australasian Railway Association called for tangible steps in 2014-15 to demonstrate pricing reform and commence supply-side reforms, including:

- Trials of direct MDL [mass-distance-location] charging on national highways.
- The development of new accountability arrangements for road agencies in relation to planning and meeting heavy vehicle requirements, with accountability to be linked to the development of pricing reform.
- The development of heavy vehicle infrastructure service standards to inform accountability arrangements. (sub. 56, p. 8)

The peak industry body for truck operators — the Australian Trucking Association (ATA) — did not support the HVCI reform project. The ATA (sub. DR176) called for the project to be disbanded on the grounds that it was developing a mass-distance-location (MDL) charging regime that would increase freight costs and not improve road provision. With respect to charging, the ATA listed several concerns.

- Charges would be based on a vehicle's maximum declarable mass because it is impractical to measure the actual mass of every vehicle for every trip. In contrast, the NTC currently devises charges that are based on the average actual mass recorded for different vehicle types at weigh-in-motion stations.
- Distance and location charges would rely on automated tracking devices that are not cost effective for many truck operators, or an alternative paper-based system that increases their compliance costs.
- MDL charges would not replace fuel excise and the associated system of fuel tax credits, and so truck operators would face two charging systems and two sets of compliance burdens.
- The ATA was concerned that charges for using rural and regional roads could increase significantly because such roads are built to a lower standard than major highways, meaning that trucks can cause greater damage per kilometre travelled.

Community service obligations (CSOs) were also an issue for the ATA.

> CSO considerations lie at the heart of how a road access pricing regime would be created and it should not be left to the last minute to decide how regional roads will be dealt with under this scheme. Presently, around 75% of local rural road expenditure and 50% of local arterial road expenditure is excluded from the heavy vehicle charges model cost base. (sub. 27, p. 9)

The ATA's preferred approach was to improve the current system of heavy vehicle charging. In November 2013, the NTC (2013a) published a draft regulation impact statement for public comment which outlined several options to do this. However, the NTC cautioned that there was limit to which the current system — based on a pay-as-you-go (PAYGO) methodology and charging via fuel excise and registration fees — can lead to charges that accurately reflect actual road use and expenditure.

> … PAYGO at its best represents a hypothetical approximation of the heavy vehicle share of total expenditure on roads. Since the inception of PAYGO, repeated attempts to achieve greater precision has increased the complexity of the charging framework and eroded its simplicity and transparency. With this in mind, caution should be exercised when attempting to achieve greater precision as limitations will always exist when the primary charging tools remain registration and fuel excise. The adoption of a more precise and user pays charging framework is currently being explored by the Heavy Vehicle Charging and Investment (HVCI) reform. (NTC 2013a, p. iv)

Following consideration of public feedback on its draft regulation impact statement, the NTC recommended a new set of charges to the TIC for approval.

Thus, while there was some recognition by the heavy vehicle industry over six years of development that charging reform needed to be addressed, the model to achieve this, and more importantly, the institution that could deliver it by encouraging confidence across the parties, had yet to emerge.

Shortly before this inquiry was completed, it was decided that the HVCI reform project would cease operations in June 2014. The Commission understands that, in the near term, TIC's senior officials group — the Transport and Infrastructure Senior Officials' Committee — will oversee a reform process that focuses more on supply-side initiatives, such as improving each jurisdiction's documentation of road assets and expenditure. It appears that, as a consequence, the specific charging model developed by the HVCI reform project will not be pursued.

The Commission remains of the view that a shift to more direct charging in the longer term has the potential to make the community better off. But complex reforms require an institutional base, accepted by all parties, to advance effectively agendas like direct pricing. In chapter 8, the Commission has proposed institutional changes that would apply across all road users, at a pace agreed collectively, and in

locations where the benefits would be seen in a local context. Direct user group representation would be a central characteristic of this reform, starting with allocation decisions. Such reform could lay the necessary groundwork for the adoption of more direct charging in the longer term, including by demonstrating to road users that the charges they pay are being used to fund better roads.

User charges for cars and other light vehicles

Ideally, there would be a unified *system* of user charging for all vehicles that was linked to road spending, given that light and heavy vehicles usually share the same infrastructure. Charges would, however, vary between vehicle types — as they already do for different classes of heavy vehicles — to reflect differences in the cost of provision, and also possibly vary by time of day and location. While in broad terms roads have to be made stronger to take the weight of heavy vehicles, and more road space is required to accommodate the greater number of light vehicles, the ultimate purpose of a road is the outcome for road users.

Charging of light vehicles to recover infrastructure costs currently only occurs for the small minority of (often privately operated) roads that are tolled. To date, it has been considered impractical to apply direct charging more widely to the road network. However, the development and growing adoption of vehicle telematics is reducing this barrier (box 4.3). This provides an opportunity to explore wider use of direct user charging.

Box 4.3 **Vehicle telematics and direct road user charging**

For most types of economic infrastructure, customers are charged an amount based on which services they use and how much is consumed. To do so, suppliers must be able to measure consumption, such as with an electricity, gas or water meter.

Until recently, it has been impractical to measure each customer's use of a road network. Direct charges based on actual road use only apply on a relatively small number of individual roads where revenue streams were essential to the investment or (in congestion schemes overseas) traffic volumes justify the expense of monitoring use.

The development and growing adoption of vehicle telematics — using global navigation satellite systems (GNSS) and wireless communication — is reducing the barriers to monitoring road use. Road freight operators are using telematics to optimise their fleets, and it is becoming common in new cars to aid navigation and provide services to motorists.

(Continued next page)

Box 4.3 (continued)

Governments are already using telematics to monitor road use in Australia. The national Intelligent Access Program (IAP) allows special-purpose, innovative and higher-mass vehicles to use selected roads, provided they have a remote monitoring device.

Governments have also been developing institutional arrangements and policies to support the use of vehicle telematics. For example, the Australian Government and State and Territory road agencies have established Transport Certification Australia (TCA) to certify suppliers of IAP monitoring devices. TCA also offers a certification service to those wanting to use vehicle telematics for other purposes. A privacy policy has been developed for the IAP so that road authorities only receive data if there is an access breach. The National Transport Commission is currently developing a compliance framework for heavy vehicle telematics.

Other countries are also using telematics to monitor road use, especially for heavy vehicles. In New Zealand, diesel-powered vehicles subject to distance-based charges can, instead of a traditional mechanical hubometer, use an electronic device that measures distances travelled with GNSS technology and transmits data by wireless communication. Similar schemes exist in European countries — such as Germany and Austria (called LKW-Maut and Go-Maut respectively) — although they typically compel the use of telematics. The US state of Oregon has run pilot studies of telematics-based distance charging for cars as an alternative to its fuel tax. It has legislated for an ongoing system from 2015 for up to 5000 volunteers.

Sources: NHVR (2014); NTC (2011, 2013b, sub. DR129); NZTA (2013); SCOTI (2012a); TCA (2014); Whitty (2013).

Another constraint on wider direct charging has been the reluctance of governments to act in the face of a widespread fear among motorists that they would be worse off. Thus, a clear case for reform would have to be developed and communicated to the community. The abandonment of a 2009 proposal to impose direct user charges on most vehicles in Holland appears to provide a cautionary note in this regard (box 4.4).

In broad terms, the case for reform is similar to that for heavy vehicles. Light vehicles are already subject to a range of charges and taxes, but these are only loosely related to the cost of infrastructure that the vehicles use. Moreover, the revenue is raised in such a way that there is not a clear signal to road providers to indicate where capacity changes are warranted.

Like heavy vehicles, it would be challenging, under the current split of responsibilities among governments and indirect charging, to design a system of charges that recovers the (efficient) cost of providing infrastructure services, while not significantly impeding efficient use of the infrastructure at the margin. Charges

would have to recover not only the costs directly attributable to each vehicle, but also a share of common costs that benefit all road users.

Box 4.4 **Dutch proposal for telematics-based road user charges**

In 2009, the Dutch Government proposed to implement a telematics-based road pricing scheme that involved a shift from fixed taxation of vehicle purchases and ownership to a fee per kilometre driven.

The proposed scheme was to cover all roads and vehicles except motorcycles. Charges were to vary by vehicle type, weight, and emissions. There were also plans to combine the charge with a congestion fee during peak periods and in congested areas. The variable financial cost of travelling was expected to rise by around 50 per cent for a passenger car and possibly by three times during peak periods.

It was anticipated that the legislation would pass the Dutch Parliament in the spring of 2010, but the resignation of the Dutch Government left the scheme on hold. The new government announced its intention not to introduce road pricing in the form of a per-kilometre charge.

Sources: Government of the Netherlands (2012); Kozluk (2010).

A form of multi-part pricing similar to that used for heavy vehicles may be appropriate. This would not be very different from the system of charges and taxes already faced by light vehicles. For example, the fixed registration charge can be thought of as an access fee to use the road network, while the fuel excise is the variable charge. But the continued absence of a linkage to resource allocation, as against simply achieving cost recovery, is a weakness of such a model. The objective must include charging in such a way that reveals directly the preferences of users (through price discovery) that will inform road investments (chapter 8).

The Bus Industry Confederation observed that there is a well-developed theoretical literature to inform future consideration of road pricing models and, to a lesser extent, some quantitative tools and lessons from practical experience.

> A vast literature on road pricing has emerged over the past fifty years. The small number of live examples where this has been applied, however, means that most of this literature is largely theoretical. However, … some recent very useful modelling work … and the experience from the handful of live examples where an element of road pricing reform has been implemented, is very valuable for thinking about what might work in Australia. (sub. DR127, p. 11)

A shift to direct charging on a wider basis would only be justified if the additional cost of monitoring how individual vehicles use a road network is clearly outweighed by the benefits of more efficient charging. Efficient resource allocation commonly follows the introduction or improvement of pricing systems in

market-based economies, but simply assuming there is a case for change would be unwise. That said, the transport economics literature does suggest that proper distance-based charging is superior to a fuel tax because fuel consumption is an imperfect measure of road use (Bus Industry Confederation, sub. DR127).

It would be unrealistic, and does not form the basis of this report, to expect direct user charges to ever fully fund the road network. As noted previously for heavy vehicle charging, there is a significant community service element to roads, especially in sparsely populated areas, which will have to continue to be funded by governments (effectively as some form of community service obligation).

Participants welcomed consideration of charging reforms for light vehicles

Inquiry participants generally supported the consideration of more direct user charging for light vehicles. For example, the Transport Reform Network stated that:

> … our fundamental thinking about roads needs to change. Roads are a utility — not unlike water and electricity — and we should charge accordingly … A more direct, user-pays approach would ensure that all of us pay a fair price for our use of the system … A new approach to road access pricing also creates the opportunity to establish a sustainable revenue source for the funding of transport infrastructure and services. (sub. 54, pp. 5–6)

The ALC noted there was a case for extending charging reforms beyond the current focus on heavy vehicles.

> … the HVCI concept is only designed to recover 'incremental user costs' generated by heavy vehicles and not 'total costs' — that is, the short term marginal costs incurred by heavy vehicle road use … Light vehicle use is acknowledged as being the demand driver for new roads ... Given this, there is some concern that many road owners will be loath to invest where there is a chance that insufficient demand will mean that there is a risk the service provider will not be compensated for the cost of supplying the access ... It follows that now may be the time to consider commencing the paradigm shift from the concept of road infrastructure being a public good funded by budgets and towards a concept where there is a direct charging of all uses. (sub. 48, p. 6)

The Bus Industry Confederation (sub. DR127) was also concerned that heavy vehicle charging reform was proceeding without a similar process for light vehicles. Moreover, it supported the case for more direct charging.

> … the BIC concurs with [the Commission] in identifying pricing as a pathway to greater efficiency in how we move people and deliver infrastructure in Australia … Pricing shortcomings in land transport are a major barrier to efficient use of existing infrastructure and send poor signals as to where infrastructure development is needed. (sub. DR127, p. 10)

The Transport Reform Network (sub. DR163, p. 7) expressed the view that 'any work being undertaken on road usage charging for light vehicles should be done in parallel with the HVCI Group'.

In contrast, Asciano, Aurizon, Australian Rail Track Corporation and Australasian Railway Association (sub. DR187) argued that charging arrangements for heavy and light vehicles should be developed separately because they involve different issues.

The Australian Local Government Association (ALGA) noted that there is also a case for heavy vehicle reforms to be implemented first so that any lessons can be considered before attempting light vehicle reforms.

> ALGA notes that the HVCI initiative is a partial market solution and strongly suggest that the lessons learned from the HVCI be used to assess relevant technology and institutional reform prior to any proposed extension to private and or light vehicles. (sub. DR137, p. 7)

The Commission considers that, ideally, a unified system of direct road user charging would be developed for all vehicle types, rather than on a piecemeal basis. As noted above, light and heavy vehicles usually share the same infrastructure, and the associated costs — such as for traffic lights — are often common to all vehicles.[5] Timing may be different for the take-up of such an option, both between different classes of road users and by location, but should proceed as a collective development among road users. The ultimate objective remains to use charges to link users with subsequent resource allocation (that is, project selection).

Downward pressures on fuel excise revenue provide added impetus for reform

Added impetus for road user pricing reform could come from the fact that net revenue from fuel excise — currently one of the largest sources of funding from motorists — has been lagging well behind growth in road use and the unit cost of building and maintaining roads. It is likely that this situation will continue, despite the recent decision to resume indexation of the excise rate from 1 August 2014.

The Commission estimates that, since 2000-01, net revenue from fuel excise has fallen by about 30 per cent in real terms.[6] Over the same period, road use (total

5 Roads can be developed so that some, but not all, lanes are constructed to handle heavy vehicles. In Germany, for example, autobahns frequently have a dedicated heavy-vehicle lane. The rear axle of a 13-tonne heavy vehicle can cause over 1000 times as much road damage as that of a light vehicle (Winston and Mannering forthcoming).

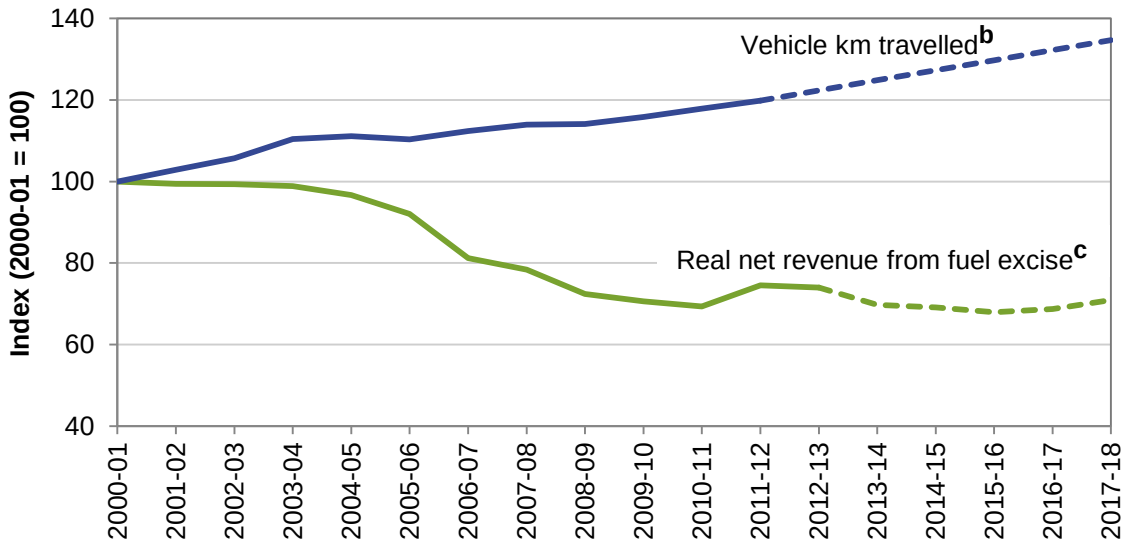
6 In nominal terms, 2013-14 net revenue is estimated to be similar to its 2000-01 level.

kilometres travelled) has grown by about 25 per cent, and the unit cost of road construction and maintenance by over 40 per cent (BITRE 2013a, 2013b).

The downward trend in real net revenue can be largely attributed to a 2001 decision to halt indexation of the fuel excise rate in line with inflation.

In its 2014-15 budget, the Australian Government (2014b) announced its intention to resume indexation from 1 August 2014, which would stop the long-term decline in real net revenue from fuel excise. However, subject to indexation being enacted, the Government's forecasts suggest that there will be little growth in real net revenue over the forward-estimates period up to 2017-18 (figure 4.1). It is therefore likely that net revenue from the fuel excise will continue to lag well behind growth in road use and the unit cost of building and maintaining roads.

Figure 4.1 **Road use and fuel excise, 2000-01 to 2017-18[a]**



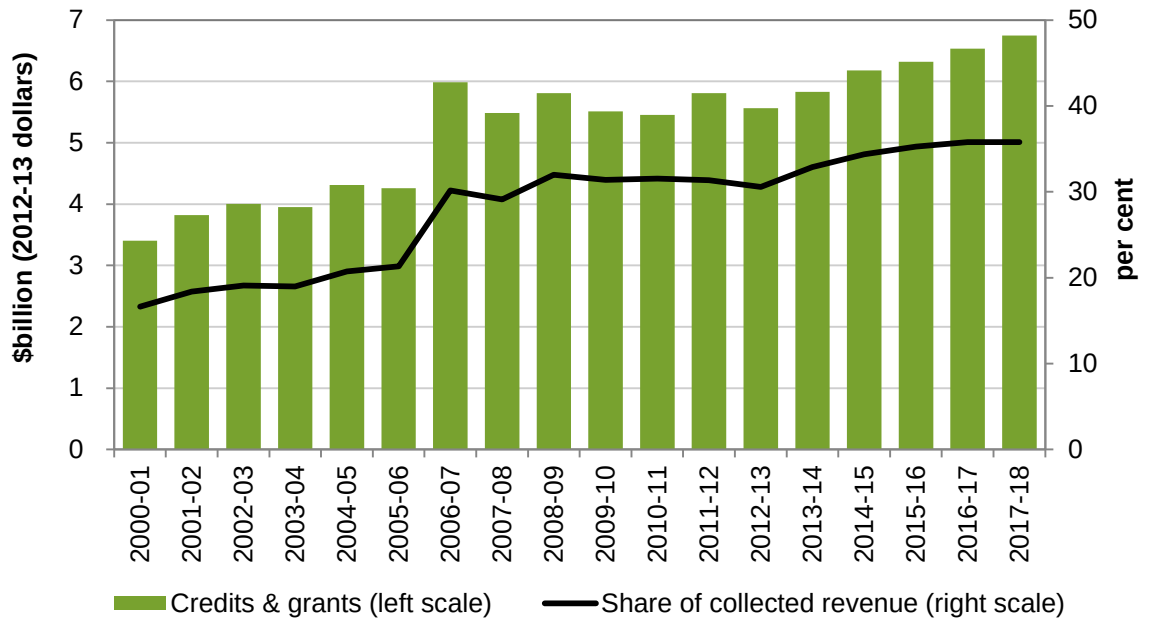
[a] Dashed lines are forecasts. [b] Total distance travelled by articulated trucks, buses, light commercial vehicles, motorcycles, passenger vehicles and rigid trucks. [c] Fuel excise revenue (measured in real terms), after deducting the amount returned as credits and grants. For 2000-01 to 2012-13, excise collected on fuels other than petrol and diesel was assumed to account for the same proportion of total revenue as in 2013-14 (20 per cent). This could lead to net revenue in those years being overestimated. Data for 2014-15 onwards include the impact of resuming indexation from 1 August 2014.

Sources: ABS (*Consumer Price Index: Australia*, Cat. no. 6401.0); ATO (2014); Australian Government (2014b, 2014f, 2014h); BITRE (2012a); BREE (2014); RBA (2014a); PC estimates.

A key reason why little growth is expected in real net revenue is that an increasing share of collected fuel excise is forecast to be refunded as credits and grants. This would continue a trend that has been evident since at least the early 2000s (figure 4.2). The trend appears to have been due to various developments, including policy changes that expanded the range of activities eligible for credits and grants, an increasing share of fuel being used for off-road activities that are eligible for fuel

tax credits, and a growing share of on-road fuel consumption being by heavy vehicles (which, unlike light vehicles, are eligible for fuel tax credits). The Australian Government (2014b) recently proposed that grants under the Cleaner Fuels Grant Scheme and Ethanol Production Grants program would end in 2014-15. However, its forecasts (incorporated in figure 4.2) indicate that this would not reverse the upward trend in the overall amount of fuel excise returned under all policies.

Figure 4.2 **Fuel excise credits and grants, 2000-01 to 2017-18[a]**



a Credits and grants comprise the Fuel Tax Credits policy, Cleaner Fuels Grant Scheme, Ethanol Production Grants and their predecessors. Share measured as a percentage of excise collected on petrol and diesel. For 2000-01 to 2012-13, excise collected on fuels other than petrol and diesel was assumed to account for the same proportion of total revenue as in 2013-14 (20 per cent). This could lead to the share of collected revenue returned as credits and grants in those years being underestimated.

Sources: ABS (*Consumer Price Index: Australia*, Cat. no. 6401.0); ATO (2014); Australian Government (2014b, 2014f, 2014h); BREE (2014); RBA (2014a); PC estimates.

A further downward pressure on net excise revenue could come from a continuing shift to more fuel efficient vehicles. The decision to reintroduce indexation will, by raising retail fuel prices, reinforce this trend.

Other developed countries face similar issues with fuel taxes as a revenue source. Thus, Consult Australia observed that:

> Reliance on traditional fuel excise as the key revenue tool to fund infrastructure is internationally recognised as having limited longevity, with diminishing reserves and increased fuel efficiency curtailing revenues. An infrastructure funding regime based on fuel taxes has no sustainable future. (sub. 23, p. 3)

The US state of Oregon has been a leader in responding to this issue by exploring a shift to direct user charges (Australasian Railway Association, sub. 58 attach.; Bus Industry Confederation, sub DR127; Transport Reform Network, sub. 54, DR163). It has experimented with pilot studies in which participating motorists paid distance-based charges as an alternative to fuel taxes (Whitty 2013). In light of the results, Oregon has legislated for such a scheme to be implemented on an ongoing basis from 2015. However, participation will be limited to 5000 volunteers because it was not possible to persuade legislators to back a mandatory scheme. Participating motorists will be charged 1.5 cents per mile rather than paying the state fuel tax of 30 cents per gallon. The revenue raised will be hypothecated to road authorities.

The Transport Reform Network noted that momentum is building for a shift to more direct road user charging across the United States.

> There are currently 12 western US states … enrolled and actively participating in the WRUCC [Western Road Usage Charge Consortium], sharing information and working shoulder-to-shoulder to push for fundamental reform of road funding … The Southern California Association of Governments is one of those leading the charge. Its 2012 Regional Transportation Plan recommended the long-term transition to mileage-based user fees to replace gas taxes by 2025 …
>
> Washington State undertook a feasibility study in 2012 and is now working towards introducing legislation for a pilot … scheme in the 2015 legislative session. [It] has so far looked at three charging models [time permits, distance charges based on odometer readings, and distance charges using vehicle telematics] … While the state government acknowledges that these RUC [road user charge] systems will cost more to collect than the gas tax, it also says they will produce greater and more stable net revenue over 25 years.
>
> ... in Indiana, legislation has just been signed into law to conduct a study into alternative funding mechanisms, including options based on vehicle gross weight and mileage … And in North Carolina, the State's Board of Transport is currently considering a report that recommends a RUC pilot study. (sub. DR163, pp. 5–6)

While Australia has not progressed as far, it is notable that motorist associations recently signalled that they support consideration of direct road user charging as part of comprehensive road funding reform (AAA 2014). To facilitate such consideration, they sponsored a discussion paper published by Infrastructure Partnerships Australia (IPA 2014) on the case for reform and what a more direct charging system could look like. The Transport Reform Network, which also sponsored this work, noted that the discussion paper essentially called for:

- a separate Productivity Commission inquiry that will chart a course for genuine road charging reform in Australia

- a program of step-changes that can pave the way for the introduction of RUC [road user charge], including the harmonisation of state registration fees and regulations for light vehicles
- large-scale trials of road pricing to test different design options, in concert with, and informing, the Productivity Commission inquiry. (sub. DR163, p. 7)

The key messages from the discussion paper were also endorsed by the Bus Industry Confederation (sub. DR127) and Philip Laird (sub. DR158).

A direct charging regime like that in Oregon could have higher administration costs than a fuel tax, given the need for monitoring devices in individual vehicles (although these can provide additional benefits, such as navigation). Necessary compliance and privacy measures would add further costs. For Australia, another issue is that, unlike the United States, fuel taxation is solely the responsibility of the national government. Thus, any move to replace Australia's fuel excise with distance-based charges would have to be coordinated between the Australian, State and Territory Governments. Moreover, there would need to be realistic expectations about revenue growth under distance-based charges. This would largely come from population increases because Australia, similar to other developed countries, has experienced a plateauing of per capita distances travelled by road since the mid 2000s (BITRE 2012a).

Gaining community acceptance for specific light vehicle reforms

The above mentioned shift by motorist associations to supporting consideration of direct road user charging as part of comprehensive road funding reform is a positive step in gaining community acceptance for change. However, such support is not unconditional. As the Australian Automobile Association noted, a move to more direct user charges purely to increase revenue could meet significant community resistance.

> … it is appropriate to begin a debate on our future road funding options, including the potential for a more direct system of user charging. However, … motorists already pay more than their fair share in motoring taxes and charges, and the perception that motorists will be asked to dig deeper into their pockets is a major impediment to winning public support ... To win the support of motorists it will be critical that the case for change is clearly laid out and the benefits of reform are properly explained … A road user charge should only be implemented as a part of genuine reform of taxation on motorists and should not be imposed on top of the existing fuel excise charges. (sub. 65, p. 9)

Thus, the Commission considers that it will be necessary for any reform to be revenue neutral when adopted, and for a specified period thereafter while community confidence is gained that there are benefits that may justify (for

example) differential pricing.[7] If — and there is scope for debate — motorists already pay their way, the greater efficiency arising from road pricing reform could be promoted as giving motorists more and better roads for a similar amount of money. It would also be fairer to only charge people for the roads they use, and greater efficiency may be achieved by having differential pricing between groups.

While revenue neutrality would ensure no increase in the taxes and charges collectively borne by motorists, a shift to more direct user charging is likely to change the distribution of costs between different groups. For example, there would be a redistribution of costs away from motorists who travel below-average distances.

A particular point of contention could be whether there is an increase in the costs borne by rural and regional residents because of the greater average distances they drive. It is not possible to give a definitive answer on this issue without a detailed analysis of specific charging models and the amounts involved, which have yet to be developed. However, the previously mentioned case for governments to continue to fund some roads as CSOs is likely to favour rural and regional residents. In the end, the distribution of charges will be a policy decision, developed (if the Commission's recommendations are followed) in a process where consumer representatives would be centrally involved.

Hypothetical charging systems published by Infrastructure Partnerships Australia (IPA 2014) and the NSW Treasury (2011) suggest that rural and regional residents could pay less if there was a revenue neutral shift to more direct road user charging. These models used a congestion charge in Australia's largest cities to generate significant revenue. Congestion charges should — if successful — reduce congestion. As a revenue source, the more effective they are, the less revenue they may generate. On the other hand, city-based charges that provide road users faster access at particular times of the day are charges for higher utility. They may prove more sustainable.

A further distributional issue could arise within cities. The National Growth Areas Alliance (NGAA, sub. DR133) noted that residents of outlying areas of cities often have to travel long distances by car because local employment opportunities are limited and public transport is not a practical option. Aside from the overly-simplified dismissal of public transport, the NGAA made the common argument that jobs should be moved closer to where these people live so they do not have to travel as far. However, this can require businesses and other organisations to

[7] One of the few participants to express a contrary view was Financial Architects Asia (sub. DR191), which argued that it was essential for road pricing to move early to raise extra revenue to fund new infrastructure and encourage behavioural change.

forgo the agglomeration benefits that are causing them to co-locate in central locations. Moreover, use of planning tools in this way seems perverse. The employment patterns of cities change over time. Businesses locate due to a range of factors, noise and other externalities being among them. Forced relocation will tend to result in lower productivity and employee earnings. In contrast, more direct road user charging would, if a significant enough element in people's lives, encourage greater residential density so that more people are located in close proximity to co-located businesses with high productivity and rates of pay.

Community acceptance of more direct charging for light vehicles will also be dependent on there being measures to protect motorists' privacy (NTC, sub. DR129; Queensland Council for Civil Liberties, sub. DR166). There is already a precedent for such measures in the case of heavy vehicles which are tracked electronically under the Intelligent Access Program. The measures only allow road authorities to receive data on a vehicle's movements if it uses a road which it is not allowed to. The Transport Reform Network (sub. DR163) recommended consideration of the privacy protections used by the Oregon Government in its recent charging trials for light vehicles. These allowed motorists to choose an in-vehicle device that wirelessly reported distances travelled without also reporting the vehicle's location. Motorists also had the option to pay a monthly flat rate with no requirement to report distances travelled. Disclosure of any personally identifiable information was restricted, and any information on locations and metered use had to be destroyed after 30 days. There were also strict penalties for breaches of these privacy restrictions.

What is the best way forward for light vehicle reform?

The Commission considers that more direct charging of light vehicles has the potential to provide a better road system for motorists, if combined with reforms that hypothecate the revenue to efficient road provision.[8] However, this requires many difficult issues to be addressed, and effective planning — a constant theme for all infrastructure — will be required.

The Commission considers that the best way forward is for the State and Territory Governments to use the opportunity created by developments in vehicle telematics to trial direct charging for light vehicles across their road networks.

The models trialled in Oregon may not be easily replicated in Australia. For example, it would difficult to amend Commonwealth legislation to allow a rebate on

8 While hypothecation of taxation revenue is typically viewed negatively, hypothecation of user charges is entirely appropriate as it is effectively a price for a service.

fuel excise similar to what occurred in the Oregon trials. For trialling purposes, repayment of 'excess' excise balances at the end of a trial would be a simpler way to proceed. The purpose of the trials should be to show consumers how much less (or more) they might pay under a revised model, and for policy makers to solve what will prove to be important practical issues with privacy and the use of technology (such as for efficient recording). Another option would be for the trials to use 'shadow prices' that motorists do not actually pay.

Advances in vehicle telematics are likely to continue apace during the trial phase, thereby reducing the future cost of full implementation. Indeed, with the Australian passenger vehicle fleet changing on average every 10 years (ABS 2013c), telematic technologies directly built into vehicles will gradually grow as they are demanded in other countries. Australia should ideally undertake trials without locking in a particular technology and maintain sufficient flexibility to enable new ones to be adopted as they emerge (NTC, sub. DR129). New insights from experiments with road user charging overseas should also be taken into account as they emerge.

Australian trials of direct charges for light vehicles should involve coordination and sharing of experiences across the different tiers of government, given that they share responsibility for road-related revenue and expenditure. This could be done through bodies such as the TIC, NTC (which is currently developing a compliance framework for heavy vehicle telematics) and Austroads (the national association for Australia's road authorities). It is also essential for motorists and heavy vehicle firms or representatives to be directly involved in order to build community acceptance. This would include bodies like the Australian Automobile Association (the national association for motoring clubs) and its state and territory affiliates.

RECOMMENDATION 4.1

The Australian Government should actively encourage State and Territory Governments to undertake pilot studies on how vehicle telematics could be used for distance and location charging of cars and other light vehicles. To do so, the Australian Government should:

- ***offer to partly fund these pilot studies***
- ***work with the States and Territories to address privacy concerns and share lessons from the trials and overseas experience***
- ***ensure that motorists are directly involved via roads and motorists associations.***

The pilot studies should be designed to inform future consideration of a shift to direct road user charging for cars and other light vehicles, with the revenue

hypothecated to roads. Heavy vehicle trials could also be developed on a similar basis.

The Road Funds proposed in recommendation 8.1 could be tasked to undertake the trials if this does not result in unreasonable delay.

Public transport

Public transport is the other significant area of land transport where direct user charges do not always reflect costs. For example, in 2010-11, public transport systems in Sydney, Brisbane and Perth recovered less than 24 per cent of their operating costs from passengers (BITRE 2012b).

Australia is not unusual in this respect. Few public transport systems anywhere in the world are run on a full cost recovery basis. The exceptions tend to be in cities with very high population densities, such as Tokyo and Hong Kong. Australian cities are much more sparsely populated, which tends to increase costs per passenger and give individuals greater scope to shift to using a private vehicle if public transport fares are increased. This combination of higher unit costs and more price-sensitive demand may explain why Australian public transport fares cover a lower proportion of costs than in some other countries (DIT 2012; Hale 2011).

The reported subsidies for Australian public transport are primarily to cover operating costs, and so have limited relevance to the consideration of infrastructure provision.

Governments may be justified in funding part of the cost of public transport for a number of reasons.

- Public transport can generate positive externalities. For example, compared to the alternatives, public transport can have a favourable impact on urban amenity, which benefits more than just travellers. Moreover, the ability of public transport systems to move large numbers of people to work in concentrated activity centres can generate agglomeration benefits for the community as a whole.
- Equity goals may be achieved by subsidising the travel of some passengers, such as concessional fares for low-income groups.
- As noted above, there may also be a case for subsidising public transport because it is impractical to directly address negative externalities associated with car travel, such as congestion.

The issue for policy makers is, therefore, generally not whether public transport should be subsidised, but whether the current balance between user charges and

government funding is appropriate. Additionally, public transport infrastructure might also be funded, in some circumstances, through value capture as discussed in the next section.

4.2 Value capture

Value capture is an approach that seeks to fund infrastructure from a wider range of beneficiaries than users. Many inquiry participants expressed interest in exploring this approach (for example, Committee for Melbourne, sub. 30; Consult Australia, sub. 23; Council of Mayors (SEQ), sub. 38; Department of Infrastructure and Regional Development, sub. 64; Housing Industry Association, sub. 21; Office of the Infrastructure Coordinator, sub. 78; Property Council of Australia, sub. 53; Smart Infrastructure Facility, sub. 94). The Victorian Government (sub. 81) noted that it had commenced work on developing a value capture framework.

Four value capture methods are considered below:

- betterment levies
- tax increment financing
- hypothecation of tax increments to an infrastructure fund
- property development.

Betterment levies

Governments can compel individuals and businesses in a given area to fund specific infrastructure — such as a public transport facility — through a betterment levy. This can take the form of a supplement on property rates or payroll taxes. The underlying logic is that the benefits from local infrastructure are reflected in higher property values and business activity, and a betterment levy provides a means of readily capturing part of those benefits to fund the infrastructure.

There is a long history of betterment levies being used to fund infrastructure in Australia (box 4.5). They have also been used overseas, such as in Denmark, Japan, Spain and the United Kingdom (VCEC 2006).

In principle, a betterment levy can be an efficient means of recovering the cost of infrastructure that has diffuse benefits across local residents and businesses. It can be administratively straightforward to implement as a supplement to existing taxes and, as a relatively small impost on an immobile resource (land), may not

significantly distort economic activity.[9] Moreover, a betterment levy can be used to fund the portion of infrastructure costs that cannot be recovered through an efficient user charge set at short-run marginal cost.

Box 4.5 Australian examples of betterment levies

Sydney Harbour Bridge

The Sydney Harbour Bridge was partly funded by a levy on landholders both north and south of the harbour whose properties were expected to rise in value due to construction of the bridge. The levy was set at 0.2 per cent of a property's unimproved capital value. It was originally expected that the levy would recover one-third of the cost of the bridge, but it was removed after only 15 years.

Melbourne Underground Rail Loop

The City of Melbourne introduced a betterment levy in 1963 to contribute to the funding of the Melbourne Underground Rail Loop (commonly known as the City Loop), which was opened in phases from 1981 to 1985. It was originally expected that the levy would be in place for 53 years and recover 25 per cent of the cost of the project. The remaining funds were to be provided by the Victorian Government (50 per cent, partly recovered from a public transport ticket levy) and the Melbourne and Metropolitan Board of Works (25 per cent). However, the symmetry of this plan was quickly altered under local pressure and ultimately the residual betterment levy was removed in 1995.

Eddington (2008) reported that the original requirement for annual contributions of 25 per cent each from the City of Melbourne and Melbourne and Metropolitan Board of Works was phased down over time to zero, and the Victorian Government ultimately covered most of the cost of the project.

Gold Coast Light Rail

The Gold Coast Light Rail project is a 13-kilometre light rail system that is being constructed from Griffith University to Broadbeach, passing through the key activity centres of Southport and Surfers Paradise. The Gold Coast City Council is to contribute 13 per cent of funding, a portion of which will come from a City Transport Improvement Charge (currently $111 per property and used to fund a range of transport initiatives). The remainder will come from the Queensland Government (49 per cent) and Australian Government (38 per cent).

Sources: Australasian Railway Association (sub. 58, DR178); Committee for Melbourne (sub. 30); Department of Infrastructure and Regional Development (sub. 64); Eddington (2008); Ergas (sub. 87); Lee (2007); Mares (2012); Spearritt (2007).

9 In their comprehensive review of the tax system, Henry et al. (2009) found that land taxes and council rates had among the lowest efficiency losses. Specifically, an extra dollar raised from land taxes or council rates was estimated to cause a welfare loss of around 9 cents, compared to about 25 cents for labour income tax and almost 40 cents for motor vehicle taxes.

There are, however, some limitations with betterment levies.

- The benefits that an infrastructure project generates for local property owners and businesses can be difficult to quantify.
- The compulsory nature of the levy means that it could be applied when there are few, if any, benefits. Thus, unlike user charges, a betterment levy does not provide a clear market signal about whether infrastructure is warranted.
- The area subject to a levy may not match the geographic distribution of benefits if, for administrative simplicity, it is based on a boundary already used for another purpose, such as to levy general rates.
- Within the levied area, benefits could vary markedly between properties and not be reflected in the levy. For example, the Gold Coast Light Rail project is partly funded by a flat levy on all properties (currently $111 per property to fund a range of transport initiatives), even though most of the increase in land values is likely to be for properties in close proximity to stops along the rail line.
- Betterment levies can come under political pressure from land owners and local businesses, causing them to be removed before the intended contribution to infrastructure costs has been made. This was the experience with levies meant to partly fund the Sydney Harbour Bridge and Melbourne Underground Rail Loop (box 4.5).

In summary, betterment levies may be appropriate when infrastructure has diffuse benefits on land values, and these are substantial and quantifiable. However, there are a number of practical challenges in setting such levies. Moreover, experience with betterment levies being removed prematurely raises doubts about whether they can be a genuine funding source over an extended period. Nevertheless, betterment levies should be considered as a potential funding source when a project has a sizeable group of beneficiaries beyond users. As discussed in chapter 8, the creation of local Road Funds could provide an opportunity to implement betterment levies.

Tax increment financing

The revenue collected from existing property taxes will tend to increase when new infrastructure raises the value of properties. Tax increment financing (TIF) uses the expected increase in property tax revenue as security to finance the infrastructure. This involves hypothecating a portion of future revenue from property taxes to underwrite loans and/or bonds that finance a project. The hypothecation usually ends after a fixed period, such as 25 years.

In the United States, all but one state has a statutory framework enabling the use of TIF by local governments (IFWG 2012). The UK Government introduced similar legislation in 2012, with £150 million initially earmarked for TIF projects from 2013-14 (Langley 2013).

The Property Council of Australia noted that the US approach typically operates as follows:

1. government sets a prescribed development area
2. an infrastructure plan is agreed and rolled out
3. a local TIF authority is entitled to a share of the incremental increases in tax revenue resulting from increased land values
4. the TIF authority uses that funding to repay debt ... (sub. 53, p. 23)

A frequent criticism of TIF programs in the United States is that they simply move economic activity from one area to another, rather than generating growth for a wider region. Langley (2013) noted that few US states have state-wide land use planning, and local governments can compete fiercely for commercial and residential development to increase their tax bases.

Several inquiry participants supported consideration of a TIF approach in Australia (for example, Bus Industry Confederation, sub. 43; Urban Development Institute of Australia, sub. 40; Victorian Government, sub. 81). However, the Property Council of Australia (sub. 53; DR131) argued that TIF and other value capture approaches are inappropriate while Australia retains its wide range of property taxes.

There are a number of issues associated with the TIF approach that raise doubts about whether the benefits outweigh the costs.

- There is a risk that the infrastructure project generates a smaller increase in tax revenue than expected, such that it is below what is required to service the associated debt.
- Unless a government guarantees a return on the project's finance, the price of borrowing may be higher than for standard government debt.
- Hypothecating part of future tax revenue to a specific project can add complexity and may not be more efficient than relying on consolidated revenue.
- Changes may be required to existing arrangements for public borrowing before local governments can hypothecate part of their expected future revenue to underwrite debt for specific infrastructure projects.

In light of the above, the Commission considers that governments should be cautious about, but not ignore, the TIF approach. Among other things, it requires

full consideration of the risks involved in underwriting debt with an uncertain increase in future property taxes.

Hypothecation of tax increments to an infrastructure fund

The Property Council of Australia (sub. 53, DR131) and South East Queensland Council of Mayors (sub. DR119) proposed that tax increments resulting from infrastructure projects be partly hypothecated to a regional infrastructure fund. The underlying logic was that, by reinvesting some of the returns from past projects back into an infrastructure fund, the need to draw on traditional year-to-year funding from consolidated revenue would diminish over time.

The South East Queensland Council of Mayors (sub. DR119, attach.) submitted a scoping study that it had commissioned from KPMG in conjunction with the Property Council of Australia and Queensland Government. The scoping study noted that further work would be required on issues such as how to ascertain the tax increment attributable to new infrastructure, whether this would include taxes raised by the Queensland Government as well as the relevant local governments, and what proportion of any tax increment would be hypothecated to an infrastructure fund.

The proposal was inspired by a model — termed 'City Deals' — that has recently emerged in the United Kingdom, with the first example finalised in June 2013 for the Greater Manchester area. It is too early to assess the results of that model. Moreover, as noted in the KPMG scoping study, the UK model involves an arrangement between the national government and local governments. In contrast, KPMG considered an approach that, at least initially, would involve the Queensland Government and its local councils.

The Commission considers that the broad proposal made by the Property Council of Australia and South East Queensland Council of Mayors requires further work on the details, if a sound case is to be made for implementing it. The South East Queensland Council of Mayors (sub. DR119) noted that it was waiting for a commitment from the Queensland Government to proceed to undertaking work on the specifics of the proposal and engaging in wider stakeholder consultation. The proposal in chapter 8 to establish local Road Funds could also be relevant.

Property development

The provision of infrastructure on a given plot of land can create profitable opportunities for property development on or near that land. This is often associated with transport infrastructure, such as a railway station, which can make it

financially attractive to develop adjacent retail, office and residential space. The created development opportunity will have a value, and this can be captured by selling development rights as part of a tender to build public infrastructure. Alternatively, a government infrastructure operator could develop and manage an adjacent property development to provide a revenue stream for funding its infrastructure.

Property development has been widely used overseas to fund public transport. For example, Hong Kong's MTR Corporation has developed shopping malls on and around twelve of its stations (IFWG 2012). Property development has also been used to fund Japan's high-speed rail system and San Francisco's Bay Area Rapid Transit (Australasian Railway Association, sub. 58).

Australian examples of transport-related property development include Chatswood (Sydney) and Melbourne Central railway stations, where air rights were used to build major retail and residential complexes in exchange for building station precincts (IFWG 2012).

Certain Planning and Hopman Consulting (sub. 91) argued that air rights could be exploited more extensively in Australia. They referred to a NSW Legislative Assembly inquiry on utilisation of rail corridors, which recommended a number of initiatives to encourage adjacent property development (CTI 2012). The NSW Government (2013a) responded to the recommendations by outlining a number of measures that it had in place, or was developing, to facilitate transport-related development. This included the investigation of development opportunities as part of a draft metropolitan strategy and a transport master plan.

Urban renewal projects are another example of how governments can use property development to fund public infrastructure. For example, the WA Government has established a Metropolitan Redevelopment Authority (MRA) to oversee the rehabilitation of a number of 'brownfields' sites in the Perth area. The MRA can acquire, assemble and sell land, as well as control development. One example of its projects is Perth City Link, which is reconnecting the Perth CBD and adjoining suburb of Northbridge. The first stages of work have included 'sinking' a rail line, relocating a bus station underground, demolishing an old entertainment centre, and creating new development sites. (MRA 2013).

In conclusion, using property development to fund public infrastructure has proven to be an effective option on some sites. Governments should closely consider such opportunities where possible. When it involves the sale of development rights to the private sector, there should be a transparent and competitive process to ensure that taxpayers receive value for money.

More broadly, the above discussion of user charges and value capture options indicates that there is merit in requiring governments to utilise opportunities for users and other beneficiaries to fund a project before resorting to government funding. In chapter 7, it is recommended that this be part of a package of best-practice arrangements that governments adhere to for the provision of public infrastructure.

4.3 Developer contributions

Developer contributions are up-front contributions that property developers are required to make to infrastructure associated with the land they develop. Such contributions can take three forms:

- land transfer — land ceded or 'gifted' to the government by the developer for roads, public open space, primary school sites, drainage and other reserves
- work-in-kind — infrastructure works and facilities constructed by developers and subsequently transferred to public authorities on completion, such as public housing
- developer charges — financial contributions to the cost of acquiring land for public use, or the provision of infrastructure by others (Chan et al. 2009).

Master Builders Australia argued that builders generally prefer to meet an infrastructure requirement, rather than pay charges to local governments.

> The dominant model has been for a long time quite simply the local council prescribes the charges, sets out essentially an invoice and says, 'Right, well, for 20 blocks of land it's going to be X dollars,' and then the builder developer has to hand over a cheque and the local government provides it. The other model is the local government prescribes what is required and as long as the builder meets the requirement to the standard specified then they're happy with that. As a general rule the industry would probably prefer the latter one. (trans., p. 51)

Developer contributions have been contentious because many infrastructure costs previously recovered over time from home owners through utility charges and council rates are now recovered up-front from developers. However, such a shift can be justified on economic grounds. It gives developers an incentive to take account of a wider range of infrastructure costs when deciding where and how to develop land, which could facilitate more efficient provision of housing and associated infrastructure (Henry et al. 2009; PC 2004).

Another often-expressed concern is that developer contributions increase the cost of housing (for example, Housing Industry Association, sub. 21; Master Builders

Australia, sub. 88). However, when the supply of land for housing is restricted, as is typically the case in Australia, developer charges are most likely to reduce the above-normal return (economic rent) captured by owners of undeveloped land (Henry et al. 2009).

Of greater concern is the possibility that developer contributions do not reflect the (efficient) cost of providing infrastructure. The Urban Development Institute of Australia claimed that:

> Developer contributions are frequently opaque and unjustified in their application, and there may be no clear connection between the cost of the infrastructure provided and the contribution, to the extent that the contribution may be well in excess of the cost of the infrastructure it is supposed to pay for. (sub. 40, p. 10)

If developer contributions are greater than cost, they will be more like a tax than a user charge, with potentially adverse implications for housing affordability and supply. Charging less than cost will also foster inefficiencies. Arbitrary incentives that favour some developments over others could be a further source of inefficiency. That said, there can be a tradeoff between the cost of administering a system of developer contributions and ensuring the required contributions accurately reflect infrastructure costs.

There are measures in place in several jurisdictions to prevent the over-recovery of costs. For example, Western Australia, Tasmania and the Northern Territory have legislative provisions stipulating that councils and service providers (utilities) are not to levy developers for contributions that exceed the costs of providing infrastructure. Victorian guidelines for development contribution plans state that levies are to be based on the estimated cost of the infrastructure and can be challenged through the planning process.

Jurisdictions sometimes cap the amount that councils can charge developers, which can lead to the under-recovery of costs. For example, in Queensland, the LGAQ (2013) estimated that there is a shortfall between developer contributions and the cost of providing infrastructure to new developments of around $480 million annually. That said, it appears that the Queensland system of capped developer charges is much less costly to administer than previous arrangements. The NSW Government has created a Priority Infrastructure Fund to cover the shortfall caused by its capping of developer contributions.

Measures to prevent under and over-recovery need to be weighed against the cost of developing detailed project-specific infrastructure plans, which include estimates of costs. In 2012, the Victorian Government (sub. 81) released a preferred framework for developer levies. Once implemented, the new framework will set standard levies for different types of infrastructure, and is intended to avoid the costs associated

with drafting development contributions plans. In 2011, the Queensland Government introduced maximum infrastructure charges to simplify its developer charging system. These reforms were intended to be temporary, and the Queensland Government is currently undertaking a review to build on, and make permanent, the 2011 reforms. It aims to introduce a new system in July 2014 (DSDIP 2013).

A related issue is that councils and utilities may have an incentive to raise costs beyond what is efficient, by requiring developers to fund 'gold-plated' infrastructure. Several jurisdictions have measures in place to discourage this. For example, in Western Australia, councils are required to provide justification for the infrastructure included in development plans, and the estimated costs of providing that infrastructure should be reasonable. This could address the incentive for councils to get developers to fund more expensive options because they have lower maintenance costs. In New South Wales, development plans with contributions above a capped amount are referred to Independent Pricing and Regulatory Tribunal, which evaluates if the proposed costs are reasonable.

There is also a risk that governments and utilities will charge for the same infrastructure twice if up-front developer contributions are not matched by an equivalent reduction in council rates and ongoing utility charges.

> In cases where rates of new residents are not selectively reduced, there will be subsequent double dipping by councils, as the new residents are levied at the same rate as existing residents, despite the fact that they have already contributed towards the capital costs of the facility. (Housing Industry Association, sub. 21, p. 5)

Thus, developer contributions can add complexity to the setting of user charges. Both New South Wales and Tasmania have measures in place to prohibit councils and utilities from charging twice for the same infrastructure.

A further concern is that developers could be required to contribute to infrastructure that benefits more than the developed properties. For example, the Property Council of Australia noted that:

> Developers face an ever-expanding range of charges and levies aimed at funding the infrastructure needs of a site … These requirements have grown from a requirement to provide green space in the 1970s to now including the provision of community buildings, childcare centres, aquatic facilities and traffic management solutions … Consent authorities frequently seek the full cost of infrastructure through developer charges — despite the facilities servicing a much broader area than the development site. (sub. 53, p. 25)

In principle, developer contributions should only be made to the extent that infrastructure is attributable to the properties being developed. This is straightforward for infrastructure that is clearly related to a developed property,

such as that linking a property to a local network. It is less straightforward for networked infrastructure shared with other developments, such as water mains. Ideally, the incremental cost attributable to each property would be reflected in developer charges. For social infrastructure that provides broad-based benefits to the community, such as a library, government funding from a broad-based revenue source can be more appropriate than developer contributions. A similar point was made by the Housing Industry Association.

> … broader infrastructure that benefits the entire community … should not be funded by new home buyers. Community infrastructure will be accessible to and used by the community in general, and not solely those who purchase a home in a new residential development. (sub. DR173, p. 1)

The principle of apportioning only attributable costs to developers has been embodied in legislative arrangements in New South Wales, Queensland, Western Australia and Tasmania.

4.4 Government funding

As noted above, direct user prices should be the default option for funding infrastructure because they can provide an incentive for technically efficient provision and use, as well as improve allocative efficiency.

However, direct charges are not practical for some types of infrastructure because it is difficult to exclude those who do not pay. For example, a lighthouse is often considered to be non-excludable because it can be impractical to stop vessels out at sea from using it. Such infrastructure may also be 'non-rival' in the sense that one person's use does not affect that of others. A lighthouse can be non-rival because a vessel can use it without diminishing its usefulness to others.

Infrastructure that is non-excludable and non-rival is an example of what is termed a public good. Markets will tend to undersupply public goods because of the difficulty in charging users. If users could be charged, the good would still be undersupplied because its non-rival nature gives people an incentive to understate how much they value it, since they can 'free ride' on what others have paid for.

Another potential cause of undersupply is that infrastructure confers benefits on more than just users. This is termed a positive externality. For example, a lighthouse could prevent oil tankers from running aground and leaking their contents, thereby avoiding harm to local residents and wildlife. Similarly, health infrastructure may be used to treat illnesses that would otherwise spread to the wider population. Ideally, positive externalities would be funded by direct charges on the

beneficiaries, but this can be impractical if the beneficiaries are difficult to identify or very diffuse.

Equity goals can be another reason why full cost recovery through direct charging is considered inappropriate. For example, there is a general consensus in Australia that people are entitled to some degree of healthcare even if they do not have the means to pay for the associated cost.

Which infrastructure should be funded by governments?

Whether infrastructure has the characteristics of a public good, generates positive externalities and/or meets equity goals is often a matter of degree. If costs can still be recovered through direct charging without significantly detracting from provision, it should remain the preferred option. This is the case for most types of economic infrastructure, since users typically capture most of the benefits and can be excluded if they do not pay. The key exception to date has been roads due to the barriers to directly charging users. While developments in vehicle telematics are reducing these barriers, there is a significant community service element to roads, especially in sparsely populated areas, which will have to continue to be funded by governments. There can also be a sound case for governments to fund a large proportion of public transport infrastructure.

Hence, a mix of direct charging and government funding has often been the norm for land transport infrastructure, as noted by the Commonwealth Department of Infrastructure and Regional Development.

> Typically, transport infrastructure supported by the Commonwealth includes a mixture of taxation and user charging funding sources. For example, … whilst the construction costs of the major Commonwealth funded road projects are entirely taxation funded, funding for maintenance of the road network is broadly linked to vehicle registration, representing a charge on beneficiaries of the road system. (sub. 64, p. 16)

A mix of funding sources will have to continue, given the characteristics of land transport infrastructure. Thus, the Commission is not proposing that land transport should always be fully funded by direct charges. Rather, governments should aim to use direct charges to the maximum extent possible without causing a suboptimal level of positive externalities and undermining equity objectives.

Social infrastructure — such as hospitals, libraries, parks, community centres, sports grounds, prisons and museums — is another area where government funding can be appropriate due to public good characteristics, positive externalities and equity goals.

However, like land transport, there can be scope for some degree of direct charging for social infrastructure. For example, it is possible to exclude users who do not pay to use a swimming pool provided by a local government. Similarly, entry fees can be charged for libraries, museums and sports grounds. For healthcare, Australians can choose non-government health providers in return for paying a user charge. User charges do not apply for most government-provided healthcare, but people are required to pay for some services, such as ambulance transport in certain jurisdictions. In the case of pharmaceuticals, people have to make a co-payment under the Pharmaceutical Benefits Scheme. This is a form of partial charging. While it delivers a weaker price signal than full user charging, it still provides some signal to users about costs, and thus encourages more efficient use while creating less of a barrier to access (Henry et al. 2009).

Thus, a mix of direct charging and government funding is often possible for social infrastructure. This can deliver some of the efficiency gains from charging while using government funding to reduce the possibility of undersupply.

Which revenue sources should be used for government funding?

Given that some infrastructure has to be at least partially funded by governments, the question arises as to what is the best revenue source for governments to use. As Henry et al. (2009) noted in their comprehensive review of the tax system, public goods should generally be funded from broad-based taxes on income, consumption or land. This is because the broader the base, the lower the rate needed to raise a given amount of revenue, and the lower the efficiency costs of doing so. The same argument can be applied to infrastructure provided to meet equity goals. It is also relevant to positive externalities from infrastructure, when it is impractical to directly charge the beneficiaries because they are difficult to identify or very diffuse.

Seeking to fund public infrastructure from broad-based taxes is complicated by the 'vertical fiscal imbalance' that occurs under Australia's federal system of government. The more efficient broad-based taxes on income and consumption are typically levied by the Australian Government, whereas many of the least efficient taxes are levied by the states (Henry et al. 2009). Yet public infrastructure spending is largely the responsibility of state governments, which is appropriate because they usually have a much better understanding of local circumstances.

The ability of State and Territory Governments to tax land does give them scope to levy one of the more efficient broad-based taxes. However, relying solely on this source to fund infrastructure spending would be impractical, and probably less

efficient than also relying on revenue from broad-based taxes on income and consumption.

The Victorian Government summarised the situation as follows:

> The progressive concentration of revenue raising power with the Commonwealth Government has increasingly left states reliant on revenue transfers from the Commonwealth to discharge their infrastructure and service delivery responsibilities ... In 2013-14, Commonwealth grants will constitute 46 per cent of Victoria's total general government revenue ... At the state level there is a limited general taxation revenue base available for infrastructure investment. (sub. 81, p. 8)

Short of making radical changes to Australia's taxation system, the Australian Government therefore has a critical role in providing efficient sources of government funding for infrastructure. In chapter 7, the Commission proposes that Australian Government infrastructure funding to other tiers of government be conditional on adherence to a set of best-practice governance principles and policy processes. This would include a requirement that states and territories utilise opportunities for users and other beneficiaries to fund a project.

5 Infrastructure finance

Key points

- A substantial amount of investment in infrastructure in Australia is undertaken by the private sector — in recent years, it has typically accounted for more than half the total value of fixed capital investment. Public private partnerships (PPPs) have increasingly been used by Australian governments to finance and deliver public infrastructure, although PPPs are a small part of total infrastructure investment.
- PPPs can raise finance from the public and private sector.
  - In terms of public sector finance, Australia's vertical fiscal imbalance means that Australian Government grants play an important role in financing public infrastructure projects.
  - PPPs generally obtain private finance through a special purpose vehicle, set up to raise finance against the project itself. Private sector finance can either be debt or equity finance, or hybrid mechanisms.
- The global financial crisis saw a tightening of financial market conditions, more restrictive loan covenants, shorter loan tenors and a shift from debt to equity finance, although there is evidence to suggest debt availability is beginning to return to previous levels.
- Bank loans have traditionally been, and remain, the largest source of debt finance for Australian private sector infrastructure investors. Equity finance has a higher risk−return profile than debt finance.
- Australian borrowers have been active in offshore bond markets that are deeper and more liquid than Australia's. Further development of bond markets domestically may reduce foreign exchange risk (or cost) for infrastructure projects or improve competition in domestic sources of project financing. However, any impediments to further development of the bond market are unrelated to infrastructure.
- Australian superannuation funds have one of the highest asset allocations to infrastructure in the world although this is still a relatively minor component of their portfolios. This may reflect an appropriate risk allocation but also limited availability of these assets.

The terms of reference require the Commission to analyse how infrastructure is financed in Australia, including by the Australian, State and Territory Governments, and by the private sector. This chapter covers:

- the way infrastructure finance is provided by the public sector (section 5.1)

- private sector finance (section 5.2)
- issues in infrastructure financing markets (section 5.3).

5.1 Public sector finance

The public sector can provide finance through general government budget appropriations or government trading enterprises (GTEs).[10]

Government budget appropriations are a financing vehicle, authorised annually by Parliament, that enables a government to spend public money for specific purposes. The money for government budget appropriations is sourced from incoming cash flows to government, which might include general purpose government borrowing, taxation revenue, fees and charges, asset sales, or intergovernmental transfers (Chan et al. 2009). Under Australia's federal system, State and Local Governments predominantly have the responsibility for providing public infrastructure, but the Australian Government has greater revenue-raising ability. In this context, intergovernmental transfers from the Australian Government are a key source of infrastructure finance for State and Local Governments.

A government wishing to borrow to raise finance for an infrastructure project can use general purpose borrowing, or issue project-specific infrastructure bonds.

- General-purpose government borrowing involves the government issuing bonds in domestic or international markets. These bonds are issued by central borrowing authorities and are not linked to specific projects, which means they automatically assume the credit rating of the issuing government (although they may trade at a different yield because of liquidity and other transaction cost issues).
- Project-specific government infrastructure bonds can be secured on a particular asset and/or against the revenue stream arising from the asset. However, in Australia, project-specific government infrastructure bonds were phased out with the financial reforms of the 1980s and 1990s (box 5.1).

Finally, public sector finance can be raised through a GTE, which is a government-owned or controlled entity that can be created to operate an infrastructure asset or take responsibility for service delivery on a commercial basis. GTEs can source finance from retained earnings, government equity injections, government grants or, increasingly, by borrowing through debt security instruments

[10] Also known as public trading enterprises, government business enterprises, public corporations, state-owned enterprises or government-owned corporations.

(including those issued on behalf of the GTE by a government central borrowing authority).

Box 5.1 Project-specific government infrastructure bonds

Project-specific infrastructure bonds are securitised borrowings issued in the capital market to finance a particular project. Bonds are usually repaid from income generated from the investments or government grants and other government funds. Thus, their issuance is not necessarily dependant on project or agency revenue — for example, in the United States, issuance can be predicated on future anticipated federal aid funds. In addition, they have often been issued with significant tax concessions and implicit or explicit government guarantees.

In Australia, from the mid-1800s, government entities used project-specific bonds to finance capital works. By the mid-1970s, there were a large number of government entities with their own capital market instruments competing in a reasonably small domestic financial market. This resulted in a relatively high cost of financing. In response, governments moved towards alternative financing vehicles, such as the provision of loans on favourable terms from state government-owned banks.

However, with the microeconomic reforms to government trading enterprises during the 1980s and 1990s, these subsidies were removed. All borrowings by State and Territory Governments were brought under their respective central borrowing authority in order to create the following efficiency gains:

- avoid unwarranted competition for scarce capital funds by rationalising approaches to the capital market
- improve bond liquidity, debt management and secondary market turnover
- increase marketability, resulting in lower yields and thus a lower cost of capital
- improve the quality of information provided to investors in regard to the volume and maturity of existing securities
- facilitate issuance of new debt instruments that target household investors
- develop expertise and specialist financial skills at a jurisdictional rather than an individual authority level.

Nowadays, central borrowing authorities generally do not distinguish between the purposes of borrowing, nor do they communicate on whose behalf they are borrowing. Thus, project-specific government borrowing was essentially phased out in Australia.

Source: Chan et al. (2009).

GTE borrowing is reported in annual GTE financial statements rather than the government's budget, which is why it is sometimes described as being 'off-budget'. However, this description could be misleading. GTE borrowing is subject to an explicit or implicit government guarantee which allows the GTE to raise capital at a lower interest rate than its private-sector counterparts. Because of the risks to the

fiscal outlook posed by these guarantees, credit rating agencies incorporate these contingent liabilities into their assessment of sovereign credit risk (Cebotari 2008).

The provision of a government guarantee (whether implicit or explicit) is one reason why governments might seek to intervene in aspects of the management of GTEs, as discussed in chapter 2. Although government guarantees can create moral hazard, there are also risks associated with the potential collapse of a GTE. One way of managing this risk is for governments to impose borrowing constraints, but unduly strict constraints can prevent GTEs from being able to address the full range of infrastructure options and may distort decisions in favour of less efficient provision.

5.2 Private sector finance

As discussed in earlier chapters, governments have historically taken responsibility for most aspects of infrastructure provision because of distributional considerations and market failures, but over the past two decades, private sector investment has grown.

The growing role of the private sector

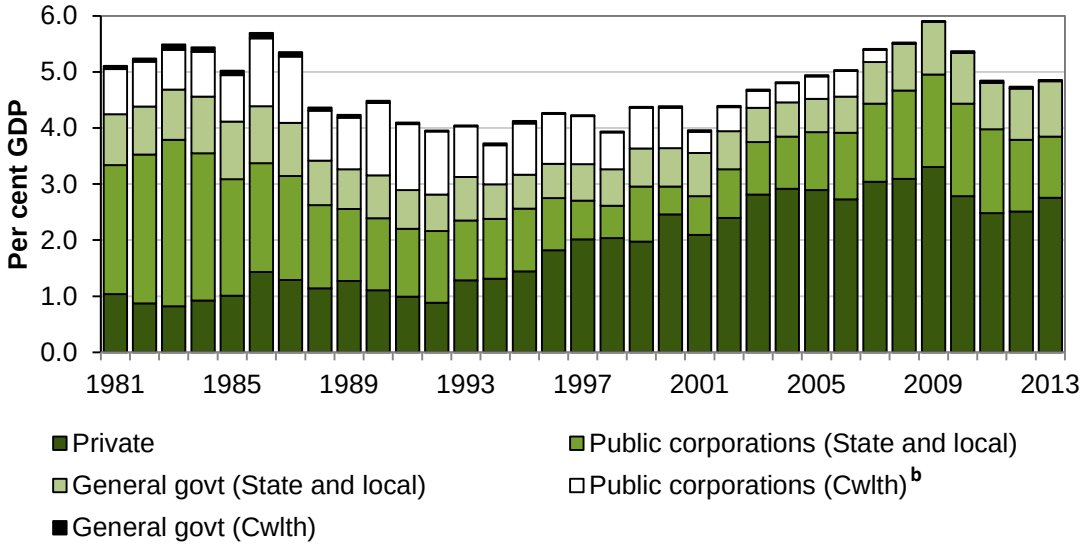
The private sector plays an important role in public infrastructure. For instance, the ABS National Accounts data indicates that the value of Australia's capital stock of public infrastructure[11] was approximately $991 billion in 2013 (at current prices), comprised of general government ($432 billion), non-financial corporations ($520 billion) and financial corporations, households and not-for-profits ($39 billion) (ABS 2013b). The non-financial corporations category includes both private and public corporations. While no accurate data are available, an indicative estimate is that public non-financial corporations owned about half the infrastructure in these selected industries, and private non-financial corporations owned the other half (or about $260 billion) (ABS unpublished, sourced from cat. no. 5514.0.55.001).[12]

[11] Estimated as the value of infrastructure in six sectors: electricity gas and water, transport postal and warehousing, public administration and safety, education and training, information media and telecommunications, and healthcare and social assistance sectors.

[12] This estimate was based on using 'buildings' and 'other construction/infrastructure' outside the general government category in the Government Financial Statistics data set as a proxy for infrastructure owned by public non-financial corporations in the six selected industries in the National Accounts dataset.

In recent years, private sector investment has typically accounted for around half of total infrastructure investment (viewed as fixed capital formation) (figure 5.1). However, this fluctuates from year to year and geographically, given the 'lumpy' nature of public and private infrastructure projects.

Figure 5.1 **Public and private investment in transport, electricity, gas, water, waste and telecommunications infrastructure[a]**



a Includes gross fixed capital formation for transport, communications, electricity, gas, water and waste. Investment in education and health infrastructure is not included, as it is not possible to distinguish between infrastructure and non-infrastructure investment in those sectors. Public corporations include government trading enterprises. **b** Data are not available for 2008–13.

Source: ABS (2013a).

Further, the amount of infrastructure in Australia provided by the private sector has increased over time, in part due to privatisation (OECD 2009). By definition, privatisation means that new investment by the entity will be undertaken by the private sector. In Australia, about $61 billion of assets between 1990 and 1997 were privatised in the financial services, electricity, gas, transport, and communication sectors, and a further $20 billion of assets were privatised between 2000–07 (OECD 2009; RBA 1997).

Where characteristics of the infrastructure make standalone private provision uncommercial, governments can share responsibility for delivery with the private sector in a range of different ways. Some examples include the use of community service obligation payments to privatised assets operating in deregulated markets, the provision of direct or indirect subsidies, and the use of public private partnerships (PPPs).

As discussed in chapter 3, PPPs have been used to involve the private sector in the finance and long-term delivery of public infrastructure projects, particularly in New South Wales, Victoria and Queensland (table 5.1).

Table 5.1 **Contracted PPPs, by procuring government and sector[a,b]**
Number of PPPs, 2006–11[c]

	Cwlth	*NSW*	*Vic*	*Qld*	*SA*	*WA*	*Tas*	*ACT*	*NT*	*Total*
Roads	-	9	3	3	-	-	-	-	-	**15**
Rail and other transport	1	4	1	3	-	-	-	-	-	**9**
Health	-	4	8	3	3	3	2	-	-	**23**
Education	1	2	3	4	1	-	-	3	-	**14**
Prisons and correctional facilities	-	1	6	-	-	2	1	-	1	**11**
Water	-	6	12	-	2	1	-	-	-	**21**
Search and rescue and emergency services	2	-	1	-	-	-	-	-	-	**3**
Courts, justice and police	-	-	3	-	1	2	-	-	-	**6**
Communication	-	-	2	-	-	-	-	-	-	**2**
Sports and other facilities	-	3	4	-	-	1	-	-	1	**9**
Other	5	2	2	1	-	1	-	-	-	**11**
Total	**9**	**31**	**45**	**14**	**7**	**10**	**3**	**3**	**2**	**124**

a Number of PPPs that had been contracted up to May 2013 for economic and social infrastructure. **b** Three PPPs were not included in the table because they were not directly procured by a government at the national, state or territory level. **c** Under the Partnerships Victoria model 23 PPP infrastructure projects have been contracted since 2000, while during the 1990s a range of PPPs were also delivered including CityLink, private prisons and hospitals (Victorian Government, sub. 81).

Source: Adapted from Infrastructure Australia (2014).

Despite the increasing use of PPPs, they still account for a relatively small share of capital spending on infrastructure. Since 1995, PPP projects have totalled just under $50 billion, or about 5 per cent of total infrastructure investment, although their use is higher in some states (Chong and Poole 2013).

Types of private sector finance

Broadly speaking, there are three main types of private sector finance.

- *Debt finance* has a set stream of repayments and will be repaid before equity in the event of project difficulties. There can be different classes of debt instruments which have different priority in the event of default.
- *Equity finance* may have relatively more uncertain and volatile returns (often provided through dividend payments), since it is first in line to bear losses if a project encounters serious difficulties but also receives the residual gains after debt repayments have been made
- *Hybrid instruments*, such as subordinated debt and convertible bonds, have characteristics similar to both debt and equity.

For each of the above, the investment route can be direct (involving the purchase of equity or debt in a specific infrastructure project) or indirect (through infrastructure funds or infrastructure-based companies). The investment vehicle can also be publicly traded (listed on the public stock exchange) or privately traded (unlisted) (table 5.2) — this affects the cost of finance and the liquidity of the vehicle.

Table 5.2 **Direct and indirect financing instruments**

Type of finance	*Method raised*	*Direct*	*Indirect*
Debt	Bonds	Corporate bonds of infrastructure companies, project bonds, PPP bonds	Infrastructure bond funds
	Loans	Direct loans to companies, projects, asset-backed financing	Infrastructure loan/debt funds
Equity	Publicly raised	Listed infrastructure and utility stocks	Listed and unlisted infrastructure equity funds, index funds, exchange traded funds
	Privately raised	Direct equity investments in infrastructure company/project	Unlisted infrastructure funds

Source: Adapted from Inderst (2013).

A firm can use either a corporate or a project financing structure to raise this finance (box 5.2). The largest project financing transactions in Australia to date have been in the mining sector (for instance, the Roy Hill project).

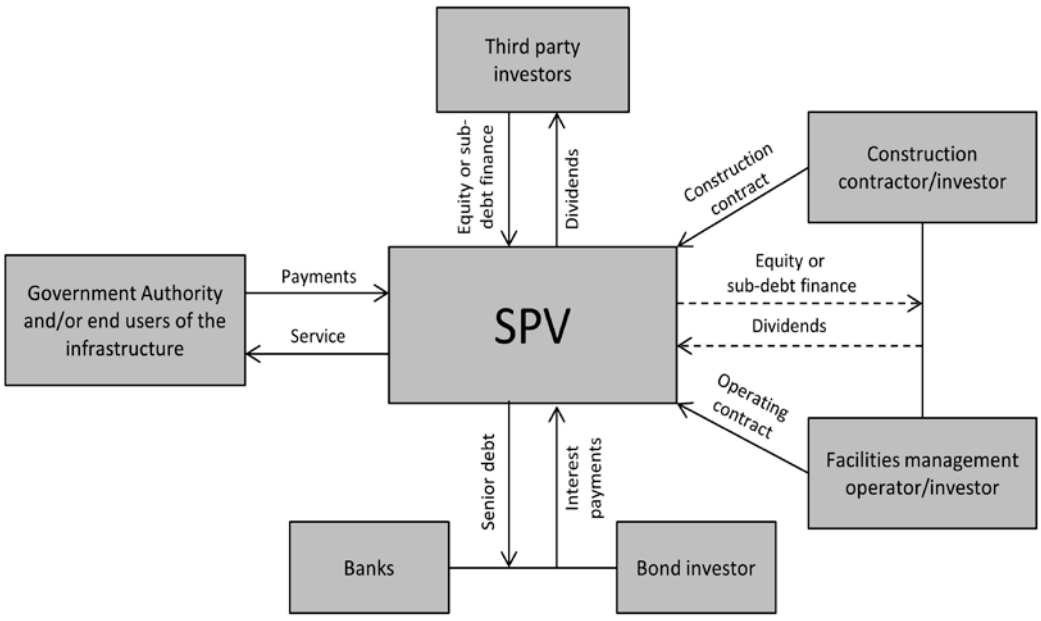
Box 5.2 **Corporate and project financing structures**

Corporate finance involves a private party, such as an operating or service company, agreeing to design, construct and/or operate a public infrastructure project, and to raise any necessary finance against its own balance sheet. The sponsor's entire operation, not just the particular project, is the source of repayment of the finance.

Project finance can be used to raise funds for large capital-intensive projects such as major public infrastructure projects. Project finance is typically raised by a special purpose vehicle (SPV) set up as a limited liability company (figure 5.2), and the lenders will look at the project's assets and cash flows as the source of the repayment of debt. The SPV will quarantine and administer risks, and also raise the required debt and equity finance for the project.

Project finance means debt is supported by the project, not by the companies sponsoring the project. Nevertheless, debt ratios are often very high for most project financings. One reason for this is because the debt is supported by a variety of contracts and guarantees provided by customers, suppliers and governments, as well as by the project's owners. Basically, the SPV has achieved risk reduction by transferring the risk through a complex series of contracts that distribute risks among contractors, plant managers, suppliers and customers — presumably allocating these risks to those best able to manage them.

Figure 5.2 **Typical project finance structure, PPPs**



Sources: Brealey et al. (2014); Engel et al. (2010); IFC (2013); NAO (UK) (2012); Yescombe (2007).

Gearing

The ratio of debt to equity in the capital structure is referred to as gearing. Since debt takes priority over equity, a greater proportion of equity in the capital structure of a PPP project reduces the relative risk borne by debt providers (Vecchi, Hellowell and Gatti 2013). Companies operating brownfields infrastructure tend to be more highly geared than many other mature companies. For instance, in 2014, Sydney Airport's balance sheet was comprised of 62 per cent debt and 38 per cent equity (Morningstar 2014). Typically, economic regulators have assumed debt levels of between 50 to 60 per cent across a range of infrastructure industries for the purposes of regulating a particular asset. Among other things, project financing structures also tend to be more highly geared than corporate financing structures because of the complex risk allocation (chapter 6).

In theory, a change in capital structure should not generally influence the total amount of risk associated with an asset. It should merely rearrange the distribution of the relative risks among the capital providers. That is, a firm's leverage does not have an effect on its weighted average cost of capital given a number of significant assumptions (including neutral taxation policy, no capital market frictions, and symmetric access to credit markets) (Villamil nd). However, in practice these assumptions do not hold, and changes in the capital structure of the project will influence the overall cost of financing (Esty 2003).

Refinancing

The risk profile of a project changes over time (discussed later). This can provide an opportunity to refinance a project, since different financiers might be attracted to a project when its risk profile is altered. However, refinancing can be sought for a range of reasons, including responding to changing market conditions or because existing finance has reached its maturity date.

Refinancing can result in changes to the financial structure of a project, including:

- a change in the price of debt
- extension of the debt maturity
- a change in gearing
- altered reserve account requirements
- release of guarantees provided by sponsors or third parties (EPEC 2013).

The market price of risk varies over time, which can affect the scope of, and future investment in, a particular project. Further, refinancing events can pose a cost and a

risk to projects. Refinancing occurs more often if shorter-term finance is persistently used. Issues surrounding refinancing are discussed later and in chapter 6.

Equity finance

There are two types of equity investors, primary and secondary investors. Primary investors invest in a project at its inception (greenfields projects) and are directly involved in decisions regarding its construction. Primary investors usually include construction and operation companies, but equity can also be raised from third-party investors (such as customers) and financial institutions (such as superannuation funds, investment banks and investment management firms). Construction companies generally do not take equity for the long term. Secondary investors are those who buy the equity of already-developed projects (brownfields projects) that have a stable net revenue stream and hence a lower risk profile (NAO UK 2012).

This section discusses two sources of equity — listed equity and superannuation funds. However, there are a range of other sources of equity, including private equity and life insurance companies.

Listed equity

Corporate equity is a major source of private finance for infrastructure and, internationally at least, companies listed on public stock exchanges are the largest owners of infrastructure assets.[13] Globally, there are an estimated 535 infrastructure stocks with a market capitalisation of US$3.25 trillion, which is roughly 6 per cent of the total global stockmarket capitalisation. Global infrastructure stockmarket indices contain up to 350 infrastructure companies, with a market capitalisation of up to US$2.5 trillion (Inderst 2013).

The Australian Stock Exchange (ASX) is the largest source of equity capital in Australia (Regan, Smith and Love 2011). As at 31 March 2014, the market capitalisation of the ASX infrastructure index was $53 billion, compared to $1509 billion for the All Ordinaries index. A number of listed infrastructure companies on the ASX have invested in a range of infrastructure assets, including airports, ports, electricity and gas utilities, and toll roads. They also tend to reinvest a significant proportion of their operating cashflow (retained earnings) into further capital expenditure — this is essentially an equity contribution (box 5.3). These data

[13] Listed companies can include companies that act as operators, contractors, developers of projects, or more diversified conglomerates acting in infrastructure sectors.

give an indication of the risk of the assets held, and where these assets are in their lifecycles.

Box 5.3 **Investment by listed Australian infrastructure companies, 2013**

Transurban — Owner of a portfolio of tollroad assets in Australia and North America which had a market capitalisation of about $10 billion, borrowings of $4.9 billion, and reinvested 81 per cent of its operating cashflow into capital expenditure.

AGL Energy Limited — An Australian integrated energy company operating retail and merchant energy businesses, power generation assets and intermediate generation plants. It had a market capitalisation of about $5.3 billion, borrowings of $3.1 billion, and reinvested 51 per cent of its operating cashflow into capital expenditure.

Sydney Airport — Owner and operator of Sydney Airport which had a market capitalisation of about $8.8 billion, borrowings of $8.5 billion, and reinvested 24 per cent of its operating cashflow into capital expenditure.

APA Group — A gas transmission company which had a market capitalisation of about $5 billion, borrowings of $4.4 billion, and reinvested 74 per cent of its operating cashflow into capital expenditure.

SP Ausnet — Owner of regulated energy assets which had a market capitalisation of about $4 billion, borrowings of $5.2 billion, and reinvested 148 per cent of its operating cashflow into capital expenditure.

DUET Group — Owner of regulated energy assets which had a market capitalisation of about $2.6 billion, borrowings of $5.6 billion, and reinvested 50 per cent of its operating cashflow into capital expenditure.

Spark Infrastructure — Owner of regulated energy assets which had a market capitalisation of about $2.2 billion, $836 million in borrowings, and reinvested 108 per cent of its operating cashflow into capital expenditure.

Envestra — Transmits and distributes gas which had a market capitalisation of about $2 billion, borrowings of $2 billion, and reinvested 103 per cent of its operating cashflow into capital expenditure.

Sources: AGL Energy (2013); APA Group (2013); DUET Group (2013); Envestra (2013); Office of the Infrastructure Coordinator, sub. 78, attach. C; Spark Infrastructure (2013); SP Ausnet (2013); Sydney Airport (2013); Transurban (2013).

Superannuation funds

Superannuation funds invest in infrastructure, usually indirectly through investment vehicles. The majority of this investment occurs in brownfields assets (box 5.4).

Box 5.4 **Superannuation fund investment in Australian infrastructure**

Superannuation funds have invested in a range of public infrastructure assets in Australia, usually at the brownfields stage.

- Australian Super took a 20 per cent direct holding in Port Kembla and Port Botany as part of the NSW Ports Consortium that successfully bid for the 99-year lease.
- Q Port Holdings (comprised of Global Infrastructure Partners, IFM Investors and the Queensland Investment Corporation) purchased the Port of Brisbane when it was privatised in 2010.
- The Canadian Pension Plan Investment Board and the Queensland Investment Corporation each hold a 25 per cent stake in Sydney's Westlink M7 toll road.
- As part of a 50-50 consortium with Hastings Funds Management (which manages funds on behalf of superannuation funds and other investors), the Ontario Teacher's Pension Plan acquired the long-term lease to the Sydney desalination plant in 2012. At the end of the lease, these assets will be vested in the private sector.
- The Caisse de Depot, a superannuation fund from Quebec, has invested $40 million in the Victorian Comprehensive Cancer Centre and $139 million in the Melbourne Convention Centre.
- The company that holds the lease to operate Adelaide Airport is partly owned by UniSuper (38.5 per cent), the Motor Traders Association of Australia Superannuation Fund (28.3 per cent), and the Local Government Superannuation Board (16 per cent).
- When the Melbourne and Launceston Airports were privatised in 1997 and 1998, the leases were purchased by the Australian Pacific Airports Corporation, which was comprised of AMP (49.9 per cent), Deutsche Bank (25 per cent), Hastings Funds Management (10.0 per cent) and BAA plc (15.1 per cent). The Australian Pacific Airports Corporation is now owned by AMP (28.5 per cent), IFM Investors (23.6 per cent), Deutsche Bank (19.9 per cent), the Future Fund (19.1 per cent), and Hastings Funds Management (8.7 per cent).

Sources: Australian Trade Commission (Austrade) (sub. 74); EY (2014); Inderst and Della Croce (2013); Infrastructure Partnerships Australia (2012).

Brownfields asset classes are attractive to institutional investors, such as superannuation funds, because they provide a long-term stable net revenue stream with low operating risks (NAO UK 2012), but some have noted that there is a limited supply of these assets (Industry Super Australia, sub. DR114) — not that it is the responsibility of government to build infrastructure to fill a demand for superannuation funds. However, it should not be assumed that superannuation funds will retain an asset over the course of its life. For example, superannuation funds traded their interests in Australia Pacific Airports Corporation (Melbourne and Launceston Airports) on secondary markets.

On average, Australian (and Canadian) superannuation funds are estimated to have invested about 5 per cent of their total assets in infrastructure, compared to less than 1 per cent by pension funds in the rest of the world (Inderst and Della Croce 2013). Estimates of the value of Australian superannuation assets allocated to infrastructure vary, but the direct allocations are estimated to have been at least $63 billion in December 2013 (box 5.5). However, the total (direct and indirect) allocation might be higher than this estimate, as superannuation funds also invest in infrastructure indirectly through listed companies and index funds, and some international (notably Canadian) funds also invest in Australian infrastructure assets.

Further, there is likely to be significant variation in the level of investment in infrastructure between types of superannuation funds, since larger funds have scale advantages which allow them to have a greater proportion of their assets invested in more illiquid asset classes (Industry Super Australia, sub. 60).

Box 5.5 Estimates of Australian superannuation fund investment in infrastructure

Superannuation assets available to invest in infrastructure were approximately $1.25 trillion as at 31 December 2013 (ASFA 2014) (excluding assets of self-managed superannuation funds, which comprise around one-third of total assets).

There are no comprehensive data on the proportion of superannuation fund assets allocated to Australian infrastructure. The Australian Prudential Regulation Authority does not report data on superannuation fund investments in infrastructure.

However, for asset allocations to the default investment strategy for entities with more than four members, infrastructure is included in 'other assets', which amounted to 13 per cent of total assets. Thus, superannuation investments in infrastructure could have been as high as $110 billion as at 30 June 2010, but is likely to have been less. Previous estimates place it at around 5 per cent of total assets (EY 2014). If 5 per cent of this was invested in infrastructure, this would have amounted to about $63 billion at December 2013.

The overall proportion of finance provided by pension funds is relatively small. Between January 2012 and February 2013, pension funds provided about 3 per cent of global project finance, compared to 8 per cent provided by investment managers and 7 per cent by insurance companies (Inderst 2013).

Debt finance

Debt constitutes a large proportion of infrastructure financing — it can comprise up to 90 per cent of the total capital expenditure for some PPP projects (Chan et al. 2009). Further, Australian infrastructure firms tend to be more highly geared (that is, have a greater proportion of debt in their capital structure) than firms in other industries and similar firms overseas (RBA 2014b). Bank loans are the most important source of project finance for PPPs, comprising 75 per cent of all global project finance provided in 2012 (Inderst 2013). In Australia, total debt of listed infrastructure firms is about $40 billion, or about 5.5 per cent of banks' total business lending (although this will understate lending, as most of the infrastructure sector is unlisted) (RBA 2014b).

Bonds are a form of debt security with a maturity at issue of at least 12 months. In 2012, bonds comprised just 6.5 per cent of all global project finance provided, although they are likely to comprise a much larger proportion of debt financing for mature public infrastructure (Inderst 2013).

Broadly speaking, bonds can be categorised as government bonds, non-government bonds, or asset-backed securities (Black and Kirkwood 2010). Within the non-government bond sector, bonds can be issued by financial corporations or non-financial corporations. Bonds issued by non-financial corporations are referred to in this report as 'corporate bonds', and when a corporate bond is issued by a special purpose vehicle to finance a particular project, it is referred to as a 'project bond'. Public infrastructure projects can use both corporate and/or project bonds to raise finance.

Bond markets normally require issuers to obtain credit ratings, which is where credit enhancement structures such as those provided by monolines can play a role, particularly for greenfields infrastructure projects (box 5.6).

Box 5.6 **The role of monoline insurance companies**

Monoline insurance companies sell insurance against default by a bond issuer. For a fee paid by the bond issuer, monolines guarantee payment of the bond's interest and principal. In effect, monolines lend their higher credit rating to less creditworthy infrastructure debt issuers in order to provide the bond issuer with a reduction in borrowing costs. These savings to the bond issuer outweigh the cost of obtaining the guarantee (McNichols 2003).

Providing this guarantee requires the monoline to evaluate and price the unique risk of the project or issuer (Assured Guaranty Ltd, trans., pp. 19–20). Thus, monoline insurers can also provide a central point of expertise when negotiating finance for greenfields projects (Herbert Smith Freehills, sub. DR192).

Once the guarantee has been provided, each monoline insurer then reinsures a large part of its risk with other insurance companies in the market (Schich 2008; Yescombe 2007).

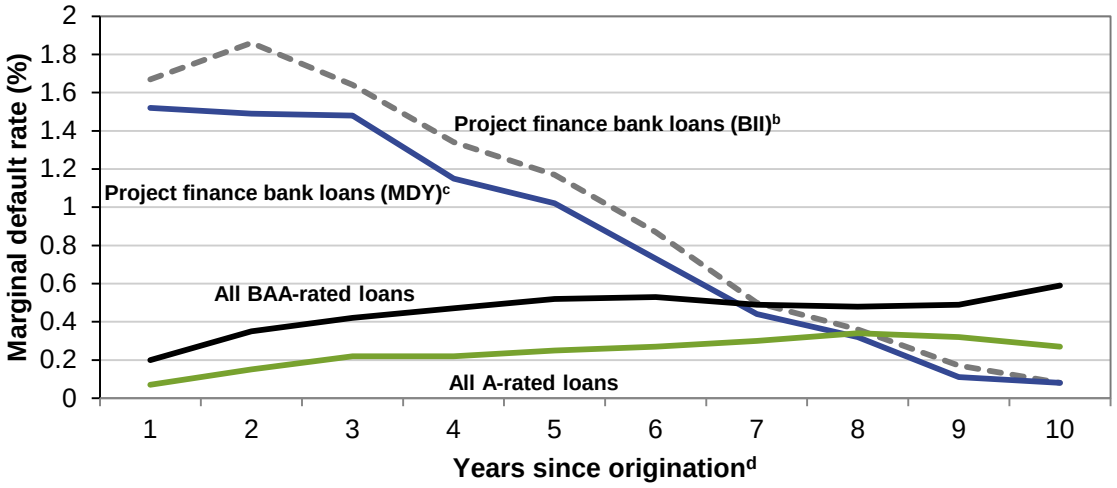
These credit ratings change over time as the risk profile of the project changes. For example, when the average marginal annual default rates for bank loans are examined, the project finance bank loans show a decline in default rates over their life, until they converge to be broadly equivalent to the default rates of A-rated loans after the eighth year of issuance. By contrast, the default rates of BAA and A-rated loans remain broadly stable over their ten year life (figure 5.3, panel A).

However, this trend of reduction in marginal default rates over time is less apparent for infrastructure bonds when they are compared to all non-financial corporate bonds that have been issued (figure 5.3, panel B). This is because the data for bond tenors greater than four years are likely to be biased in favour of infrastructure bonds, since these bonds typically have a more stable credit rating than other bonds.[14]

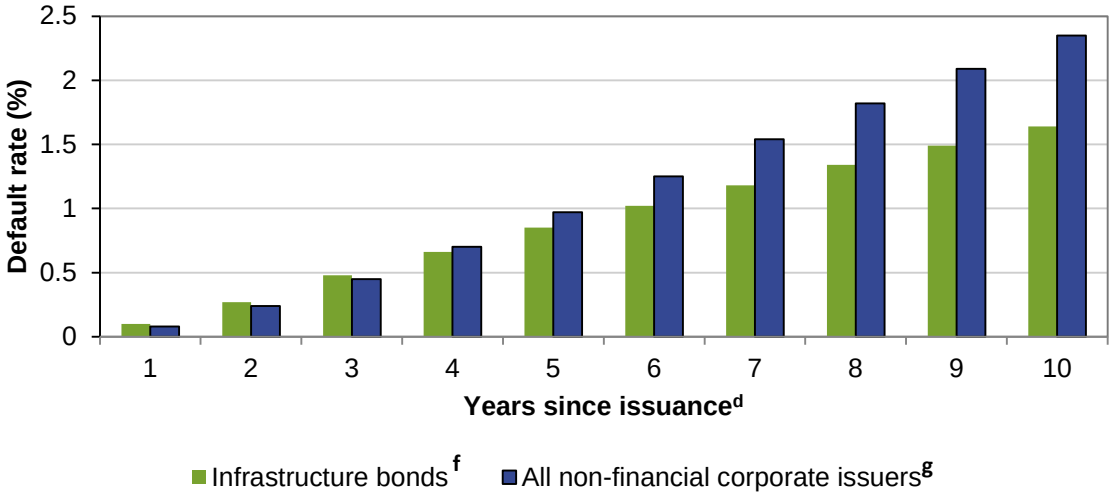
[14] Corporate infrastructure and non-financial corporate ratings for bonds imply similar credit loss rates for horizons up to about four years. However, beyond four-year horizons, infrastructure bond credit ratings become less comparable to the credit ratings of all non-financial corporate issuers. This is because credit ratings are set to reflect credit risk over a three to four year period. Infrastructure credit ratings tend to be more stable and less likely to be downgraded than credit ratings for other non-financial corporate issuers. Hence, it is generally not possible to match the entire multiple-year term structure of credit risk between infrastructure bonds and bonds issued by all non-financial corporations (Moody's Investors Service 2012).

Figure 5.3 **Default rates for project finance bank loans and infrastructure bonds compared to all bank loans and bonds**[a]

(a) Average marginal annual default rates, bank loans, 1983–2011[a]



(b) Average cumulative default rates, investment grade bonds, 1983–2012[e]



[a] Marginal default rate refers to the additional number of bank loan defaults from one year to the next. [b] Basel II definition of default. [c] Moody's definition of default. [d] 'Years since origination' and 'years since issuance' indicate the start date of the debt instrument rather than the project and show a change in credit risk across the tenor of the debt instrument rather than over the life of the project. [e] Cumulative default rates are derived using a discrete-time approximation of the non-parametric continuous time hazard rate approach. A static pool cohort is formed based on the number of active projects on January 1 of each year, and the default status of the members of the cohort was tracked across the time period. Average cumulative default rate calculated from the weighted average marginal default rate in that cohort. [f] Infrastructure debts include corporate debts (the balance of total infrastructure debts that are not classified as US Municipal). This will overwhelmingly be debt for corporate infrastructure issuers, but also includes project finance debts. Data for US Municipal bonds were available but excluded because the ratings for US Municipal bonds are not directly comparable to those for infrastructure debts and non-financial corporate issuers. [g] All non-financial corporate issuers are the benchmark comparison data for all like-rated non-financial corporate issuers of bonds.

Sources: Moody's (2012, 2013b).

5.3 Issues in infrastructure financing markets

Bond finance

Participants' views

There is a widespread view that Australia's corporate bond market is shallow by international standards. This has been argued to cause a number of difficulties for Australian infrastructure seeking to obtain long-term finance.

Participants have expressed concerns that it is difficult to raise bond finance of a size sufficient for major infrastructure projects in domestic capital markets, particularly for greenfields projects with a lower credit rating (Herbert Smith Freehills, sub. 68; National Australia Bank, sub. DR124; Northern Territory Government, sub. DR210; Westpac, sub. 51). Further, the National Australia Bank submitted:

> Due to the lack of availability of infrastructure-related bonds beyond the domestic [Medium Term Note] market, the broader investor base is not familiar with this asset class. Although retail investors can readily access equities, restrictions on selling unlisted bonds to non-wholesale investors mean retail clients are not able to access … bonds … despite bonds being generally more secure and stable from a capital structure perspective. (sub. DR124, p. 3)

Participants argued that access to bond markets was important to reduce refinancing risk, mitigate against debt market fluctuations (Queensland Investment Corporation, sub. DR147), and allow borrowers to diversify their sources of finance (Norton Rose Fulbright, sub. DR134). Participants and commentators also suggested that a deepening of Australia's domestic corporate bond market would better enable capital recycling of mature assets (Smart Infrastructure Facility — University of Wollongong, sub. 94). It could also reduce the reliance on offshore bond markets (Norton Rose Fulbright, sub. DR134) with consequently lower exposure to upheavals in international financial markets (ACFS 2014; ASFA 2014).

In sum, benefits of access to a deep and liquid corporate bond market have been argued by commentators and participants to include:

- a source of finance with a tenor that matches the life of the asset
- an increased set of fixed-income investment options for domestic investors (with potentially more flexible covenant packages)
- increased competition amongst debt capital providers
- diversifying sources of finance that might reduce the cost of capital, refinancing risk, and the project's exposure to movements in the bank debt market

- reduced reliance on banks for debt financing and hence potential to reduce systematic risk (in exchange for a premium).

That said, there is no 'ideal' size and depth of a country's bond market, and well-established Australian infrastructure companies, particularly in the airports and energy sectors, seem not to have been particularly inhibited in their financing activities by the relative size of the Australian bond market. The key issue for a government is whether there are regulatory policy distortions that hinder the creation or growth of an efficiently sized domestic bond market.

The Australian corporate bond market

The size of Australia's non-government bond market (that is, bonds issued by financial and non-financial corporations) is broadly similar to other comparable developed nations (table 5.3).

However, each country's bond market has a different composition. For instance, bonds outstanding in 2013 for financial corporations were 33 per cent of Australia's GDP, but 23 per cent of Canada's GDP. Similarly, bonds outstanding for non-financial corporations (that is, corporate bonds) were 15 per cent of Australia's GDP, but 21 per cent of Canada's GDP (Debelle 2014). Thus, even though the overall size of Australia's market is comparable, there are differences in the volume of financial and non-financial corporate bonds. (There are no data specifically available on *project* bonds.)

Table 5.3 **Non-government bonds outstanding, March 2013**
Financial and non-financial corporations[a,b]

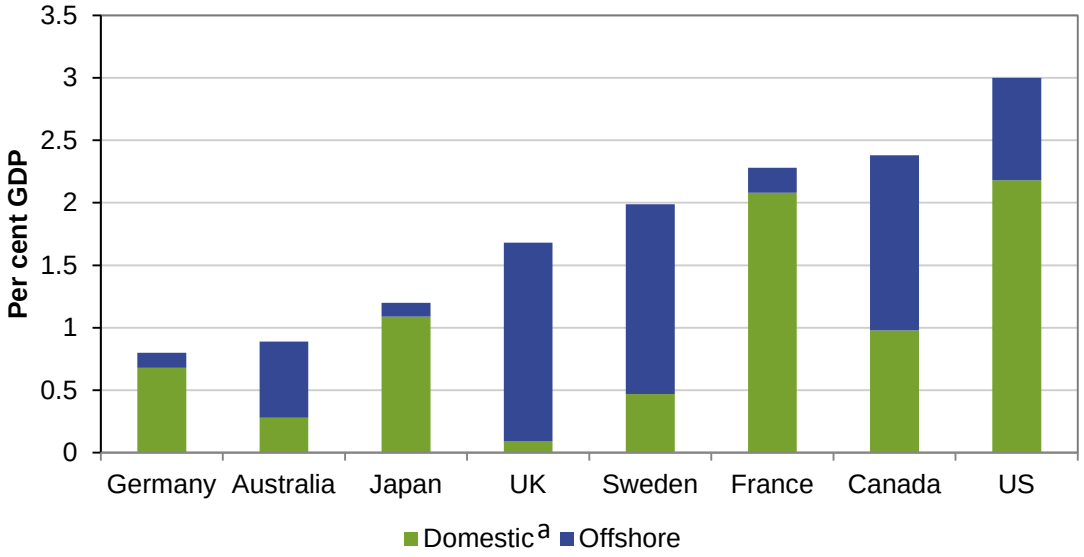
Country	*Bonds outstanding*	*Market depth*	*Rank by depth*
	$ billions	% of GDP	
United States	21 036.1	125.8	6
Japan	3 670.0	73.3	16
United Kingdom	3 467.6	139.3	5
France	2 396.7	87.5	12
Germany	2 082.1	57.9	20
Australia	1 428.6	96.0	10
Canada	821.8	45.0	23
Luxembourg	723.8	1 195.6	1
Sweden	617.0	111.8	7

[a] These data exclude bonds issued by national and local governments and supranational organisations, asset-backed securities, supra-sovereign and agency bonds, and medium-term notes. [b] Rank out of 40 developed and emerging markets in Europe and Asia (Tendulkar and Hancock 2014).

Source: Tendulkar and Hancock (2014).

The difference in the size of the non-financial corporate bond markets is evident when new issuance is examined (figure 5.4). Australia's average annual issuance is less than 1 per cent of GDP, compared to nearly 2.5 per cent of Canada's GDP and 3 per cent of the United States' GDP.

Figure 5.4 **Average annual issuance of non-financial corporate bonds as a proportion of GDP**
2005 to 2013



a In France and Germany, domestic bonds include 'eurobonds' sold in two or more countries. In the US, domestic bonds include securities that can be sold publicly in the US.

Source: Lowe (2014).

Despite this, there are some signs that Australia's corporate bond market is deepening (RBA 2014b), including increases in:

- issuance by lower-rated entities (at the BBB credit rating, issuance increased from 25 per cent of total issuance in 2012 to about 45 per cent in 2013)
- bonds issued with tenor of seven years or more increased from 20 per cent of total issuance in 2012 to about 44 per cent in 2013
- the size of issuance appears to be increasing ($525 million was recently issued in a single tranche) (Office of the Infrastructure Coordinator, sub. 78, attach. M).

There are also a number of recent regulatory changes aimed at supporting activity in Australia's corporate bond market, such as: publication of new measures of corporate bond yields and spreads by the Reserve Bank of Australia; lengthening of the Australian Government yield curve; listing of fixed income securities on the ASX; and changes aimed at developing the retail corporate bond market, such as

altered disclosure requirements and listing of beneficial interests in Australian Government bonds (RBA 2014b).

Australia's non-financial corporate bond market is shallow

The size of Australia's domestic corporate bond market could be influenced by a number of supply and demand-side characteristics.

In terms of supply-side characteristics, participants (Lend Lease, sub. DR201; National Australia Bank, sub. DR124; Norton Rose Fulbright, sub. DR134; Office of the Infrastructure Coordinator, sub. DR185) and commentators (NAB 2014) suggested that a number of factors could discourage bond issuance, such as:

- current price differentials between domestic and offshore markets
- uncertainty as to volume, pricing and tenor until the date of issuance
- reluctance of investment banks to underwrite infrastructure bonds
- regulatory requirements (such as disclosure) imposing additional transaction costs.

Demand-side factors that could potentially discourage issuance were also suggested by participants (Herbert Smith Freehills, sub. DR192; Lend Lease sub. DR201; National Australia Bank, sub. DR124; Northern Territory Government sub. DR210; Norton Rose Fulbright sub. DR134; Office of the Infrastructure Coordinator, sub. DR185) and commentators (ASFA 2012; NAB 2014), including:

- relative lack of retirement income products designed for long-term use (such as annuities)
- more unlisted than listed bonds in the Australian market
- tax arrangements that create a preference for equity over debt
- lack of liquidity in the secondary market for infrastructure project bonds
- lack of investor expertise in domestic markets
- particular characteristics of Australian institutional investors, including a heavier weighting towards equities by Australian superannuation funds compared to overseas, and a smaller life insurance industry.

Some participants also suggested (Assured Guaranty Ltd, sub. DR128; National Australia Bank, sub. DR124) suggested that the requirement for a fully financed bid poses a barrier to bond finance, but this is a procurement, not a financial market issue, and as such is discussed in chapter 6. Further, any issues in the procurement

process are likely to be specific to project bonds and not affect the broader corporate bond market.

In sum, a number of financial market factors that could influence the supply and demand of corporate bonds were suggested to the Commission. However, some of these factors are not specific to the Australian market — for instance, uncertainty about volume, pricing and tenor until the date of issuance is a feature of bond finance generally, and does not explain domestic variations in Australia's corporate bond market.

Stronger, competitive sources of bond finance could be expected to help discover the efficient price of infrastructure risk, which will be particularly important at the greenfields stage. However, the Commission was not presented with evidence of any infrastructure-specific financial market impediments to the bond financing of Australian infrastructure. Thus, if there are issues which affect the size of Australia's domestic bond market, they are likely to be broader financial market issues.

International corporate bond markets

In the absence of strong demand domestically for lower-rated corporate bonds, but desiring lower-priced debt with a term more aligned to long-term finance needs, Australian companies, including infrastructure owners or operators, have accessed offshore bond markets.

Australian issuers have been particularly active in US markets and it is not uncommon for substantial sums to be raised in Australian dollars. In particular, Australian infrastructure companies (particularly airports and electricity businesses) have for some time been active borrowers offshore, particularly in the US private placement bond market. For example, Aquasure (the Victorian desalination plant special purpose vehicle) recently refinanced $3.7 billion, including about US$400 million of bonds in the US private placement market (with around one quarter of that in Australian dollar denominated securities). Australian medium-term notes supplied a further $150 million across a diverse range of generally small placements.

In line with this trend, about two-thirds of Australian corporate bond issuance has occurred offshore since the global financial crisis (GFC) (figure 5.5). Since the GFC, risk-free interest rates have been lower overseas than in Australia, meaning that international capital markets have a lower cost of borrowing and, potentially, have a greater appetite for lower-rated (higher-yield) securities (Tendulkar and Hancock 2014). Evidence suggests that domestic investors tend to have a relatively

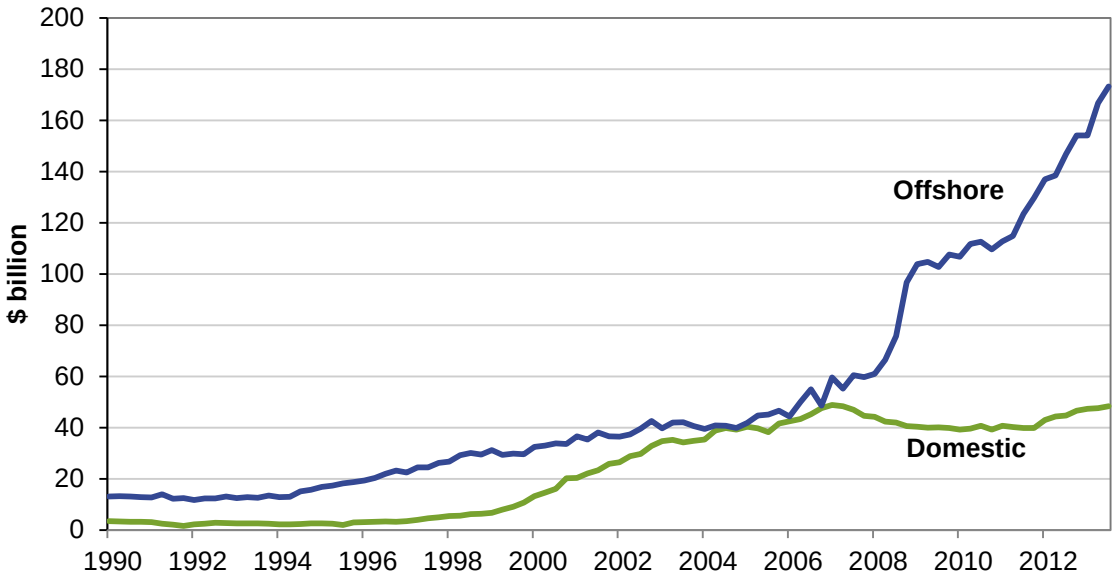
greater preference for higher-rated bonds (perhaps because of higher domestic interest rates), and many corporations that issued bonds domestically tended to have the bonds creditwrapped to increase their credit rating (Black and Kirkwood 2010).

Some have argued that lower-rated corporations might not view issuance in the Australian bond market as attractive because of 'pricing, tenor, liquidity, market scale and depth, execution risk and the need for credit ratings' (Office of the Infrastructure Coordinator, sub. 78, attach. M, p. 20), as well as desiring to hedge foreign currency risk by borrowing in foreign currency (Black et al. 2012).

While offshore issuance has been an important source of debt finance for infrastructure projects, issuing offshore could impose additional transaction costs, including cross-currency swaps and the requirement for government consent to foreign borrowings (National Australia Bank, sub. DR124). While the Commission has not been provided with any evidence on the magnitude or impact of these transaction costs, it is possible that these could create impediments to firms seeking to issue bonds offshore, particularly for smaller issuers or greenfields projects with ratings below investment grade (Herbert Smith Freehills, sub. DR192; Queensland Investment Corporation, sub. DR147).

Figure 5.5 **Australian corporate bonds outstanding**

By market of issuance, market value



Source: RBA (2014c).

International supply and demand of corporate bonds

As discussed earlier, non-financial corporate bond markets in the United States, United Kingdom, and Canada appear to be deeper and more liquid than Australia's. This could be due to a range of different factors, although a comprehensive assessment is beyond the scope of this inquiry.

There are many factors contributing to the significant depth and liquidity of the US corporate bond market. For instance, the US Municipal bond market is large, and a major contributor to infrastructure finance (Inderst 2013). However, the tax exemption for returns on municipal bonds has contributed to this market's growth, and a similar market does not exist in Australia due to different taxation arrangements.

Similarly, in the United Kingdom, the Private Finance 2 structure has introduced regulations and subsidies designed to increase the use of bond finance. For example, there is now a requirement for bids to include long-term debt, of which the majority must not be bank debt. The UK Government has also taken on some of the risk of the project by providing various guarantees and engaging in equity coinvestment (HM Treasury (UK) 2012). Australia does not have similar arrangements.

Further, there are a number of factors which differentiate Canada's bond market from Australia's, including:

- the Canadian Government takes on general market credit spread risk (both upside and downside) between the project bid date and financial close
- the majority of superannuation funds in Canada are larger defined benefit funds, whereas Australia's are predominantly smaller defined contribution funds, which might allow Canadian funds to accept more liquidity risk
- the life insurance industry is larger in Canada than in Australia
- availability payment PPPs appear to be commonly used in Canada, at least for road PPP projects (appendix D). Availability payment models significantly reduce the revenue risk of the project to the concessionaire and potentially enable higher gearing and credit ratings[15]
- most Canadian projects are A rated due to higher contractor credit ratings (potentially due to the use of availability payment models) and the provision of completion support packages, although differences in methodologies between credit rating agencies could also play a role (appendix D; Office of the Infrastructure Coordinator, sub. 78, attach. M).

[15] However, the Commission has not been presented with any evidence that suggests Canada as a whole uses availability payment PPPs more frequently than Australia.

The infrastructure-related factors above reflect a willingness on the part of Canadian governments to accept infrastructure project revenue risk for PPPs through availability payment models that Australian governments have generally eschewed. The extensive use of availability payment models in Canada may be in part because private sector involvement is concentrated in Canada's social infrastructure sector (PricewaterhouseCoopers, trans., p. 292).

The higher activity in Canada's corporate bond market appears to be a consequence of a number of different factors on the supply and demand sides. One potential reason is Canada's regulatory environment, but it is not possible to judge whether these outcomes are efficient or inefficient solely through the prism of infrastructure development.

A broader financial market issue

Infrastructure is an important part of the Australian economy, and investment in infrastructure comprised almost 5 per cent of GDP in 2013. While it is not necessary for the tenor of finance to always match the life of the infrastructure asset, particularly in the greenfields stage (chapter 6), the availability of longer-maturity debt gives infrastructure companies more options in determining the capital structure of the project, and has also been argued to provide competitive pressures (Queensland Investment Corporation, sub. DR147).

(However, it is worth noting that the balance sheets of infrastructure businesses exhibit a preference for finance with a range of maturities as part of active debt management practices. This is discussed further in chapter 6.)

All else equal, the economy could benefit from access to a deep and liquid corporate bond market. Flow-on benefits could then accrue to infrastructure finance and to the broader economy. The evidence examined above suggests that Australia's corporate bond market appears shallower than in some other countries.

However, given that the factors suggested by participants appear to be broader financial market issues, any query about the depth of, and access to bond markets is best dealt with through consideration of issues not limited to infrastructure finance. The risk of creating distortions by focusing specifically on infrastructure is significant.

The Financial System Inquiry (the 'Murray Inquiry') is looking at broader financial market issues (the final report is due to be submitted to the Australian Government by November 2014). It would be appropriate for the Financial System Inquiry to look at any factors potentially impeding the development of Australia's corporate

bond market or access to international markets, and make recommendations where these factors are amenable to policy action and where this would generate net benefits to the economy as a whole. For instance, concessionary tax treatment for corporate bonds would not be a policy mechanism likely to generate net benefits for the broader economy (chapter 6 contains a discussion of past schemes that have unsuccessfully adopted this approach).

RECOMMENDATION 5.1

The Financial System Inquiry should investigate characteristics of Australia's corporate bond market to identify whether there are factors impeding its development that could be corrected by policy action and provide a net benefit to the community.

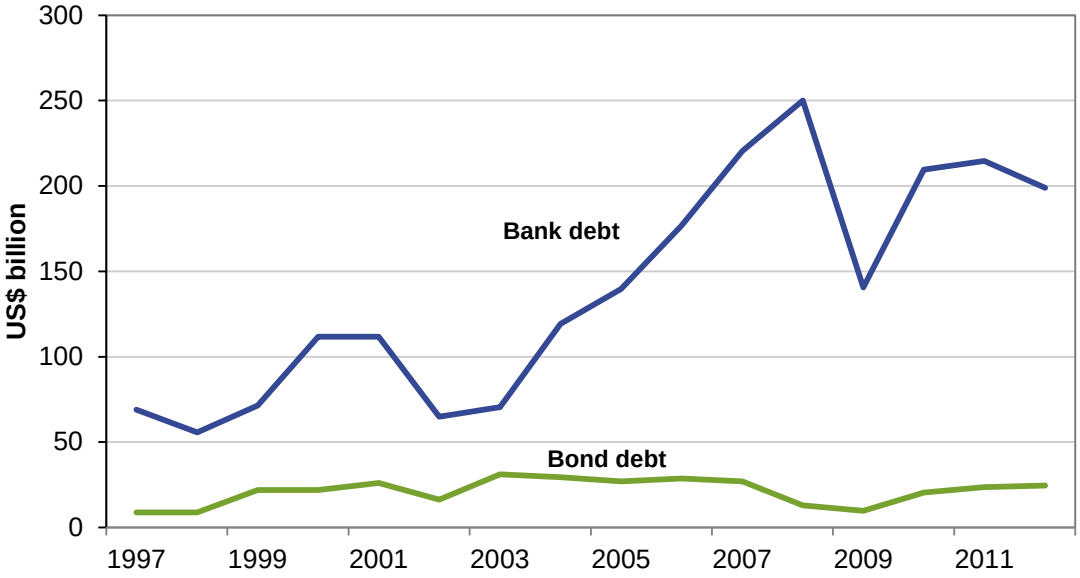
Impact of the global financial crisis

The GFC began in 2007-08, when instability in the US subprime mortgage market and suboptimal pricing of risk in international capital markets resulted in market corrections that led to asset writedowns and a repricing of risk. This caused a number of shifts in financial markets, including an increase in the cost of finance (particularly debt finance), dislocation in the asset-backed and corporate bond markets, rating downgrades for monoline insurers of bonds, and calls on debt guarantees for recently commissioned projects (ANZ 2014; McKinsey Global Institute 2013; RBA 2014b; Regan, Smith and Love 2011).

In response to the GFC and its effects on financial markets and the broader economy, central banks reduced their target interest rates and expanded the scope of their money market operations (RBA 2014b). Given this period of financial instability, risk was likely mispriced preceding the GFC, and quantitative easing since the GFC complicates the price of risk — as such, it is likely that no current price of internationally traded debt can now be considered to reflect market risk.

The Commission has previously found (in its inquiry into Australia's Export Credit Arrangements) that lending by banks has returned to pre-GFC levels, and Australian firms continue to access debt and equity finance in domestic and offshore markets (PC 2012a), and evidence suggests that global bond volumes have since recovered to 2007 levels (figure 5.6).

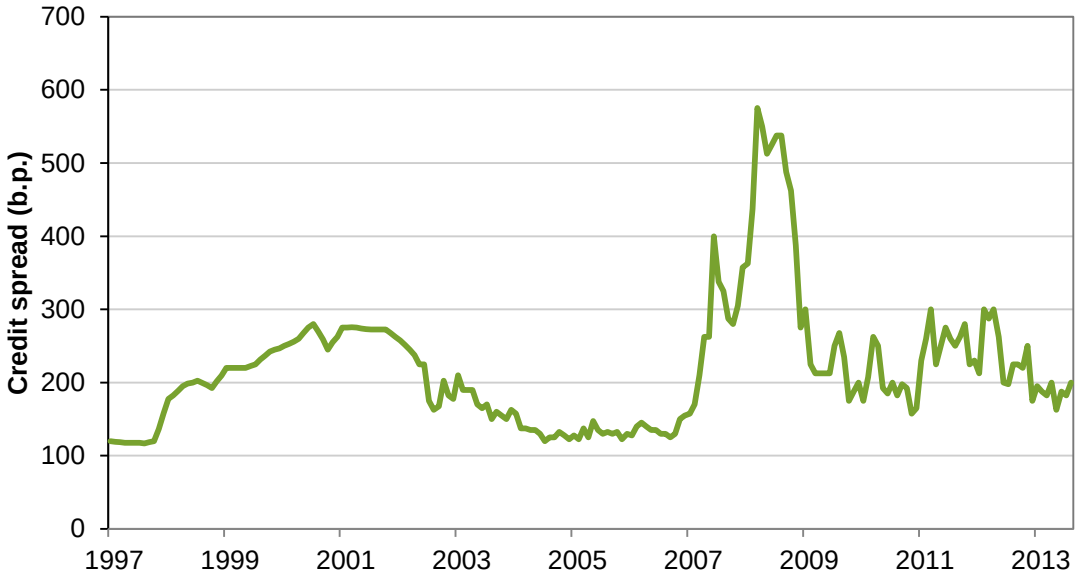
Figure 5.6 **Global project finance bank and bond debt**
1997 to 2012



Source: WEF (2014).

Further, there is evidence that credit spreads have also recovered, although they remain somewhat higher than pre-GFC levels (figure 5.7).

Figure 5.7 **Global credit spreads have recovered**
Average spread to UST, 1997–2014[a]



[a] Credit spread is calculated as the difference between the average credit spread and the US Treasury rate.

Source: Private Placement Monitor (2014).

Shift towards equity finance

Prior to 2008, infrastructure companies made greater use of external debt financing than other sectors and hence were more highly geared. In particular, they had been borrowing against existing assets, a practice that was supported by rising asset values and favourable macroeconomic and financial conditions (RBA 2014b).

Increases in the cost of debt during this period saw a reduction in gearing. For instance, McKinsey (2013) reported that, after 2007-08, globally, infrastructure projects larger than US$1 billion moved from a ratio of about 90 per cent debt and 10 per cent equity to about 70 per cent debt and 30 per cent equity. This shift towards equity was also evident in the Australian market — for listed infrastructure companies, debt to equity ratios declined from over 80 per cent in 2008 to around 50 per cent in 2012 (Black et al. 2012).

Thus, during the GFC, equity markets provided an alternative to intermediated debt markets, enabling Australian corporations to recapitalise through equity issuance (Treasury 2014). This particularly occurred for infrastructure assets that were acquired at high prices, with high levels of gearing and/or overly optimistic revenue forecasts (Infrastructure Investor 2013).

Shift towards bank loans within debt markets

During the GFC, stress in wholesale debt markets resulted in borrowers relying on shorter-term, more intermediated credit. However, from 2009 onwards this trend began to reverse as bond spreads narrowed (Black, Brassil and Hack 2010).

There are concerns that bank loans remain subject to higher borrowing costs, shorter loan tenors and more extensive covenants (AMP Capital 2013). In the years following the GFC, longer-term debt became more expensive to reflect the risk of mismatch between short-term funding and long-term lending (CBA 2014). This was driven by a reassessment of liquidity risk (in part driven by regulatory reform), leading to a repricing of banks' liabilities and a shift towards holding more liquid assets (RBA 2014b).

Thus, banks became more cautious on tenor (the term of their loans), with the tenor of loans now typically seven years or less (Department of Infrastructure and Regional Development, sub. 64). There are also concerns that regulatory reforms such as Basel III will drive further caution on tenor when they are implemented (Association of Superannuation Funds of Australia, sub. DR139).

This has led to concerns about 'refinancing risk'. Prior to the GFC, refinancing was perceived to be creating significant gains for the private sector (NAO UK 2002, 2012). However, there are now concerns that at the point of refinance, there is the potential for risks to materialise and a writedown in asset values to occur, particularly since the reduction in the tenor of debt finance means that refinancing is now occurring earlier in a project's life (Office of the Infrastructure Coordinator, sub. 78, attach. M; Queensland Investment Corporation, sub. DR147). Refinancing can also be an issue because the GFC increased the cost of debt beyond initial forecasts (AMP Capital 2013; Demirag et al. 2010). However, there can be benefits as well as costs from shorter-term finance — for instance, shorter-term debt could be a rational choice for lenders if increases in interest rates are expected in the short to medium term (ACFS 2014). Refinancing risk is discussed further in chapter 6.

Impact of the global financial crisis on bond markets

The global increase in the price of risk as a result of the GFC saw the cost of lower-rated bond issuance increase sharply and a reduction in bond tenor (Black, Brassil and Hack 2010). The Victorian Government argued that, for a period, bond finance became unavailable or unaffordable for some PPP projects (Victorian Government, sub. DR196).

Difficulties in the monoline insurance market further constrained bond finance during this time (Business Council of Australia, sub. 39; Herbert Smith Freehills, sub. 68, DR192; Lend Lease, sub. 46; Norton Rose Fulbright, sub. DR134; Office of the Infrastructure Coordinator, sub. 78; Pottinger, sub. 8; Victorian Government, sub. 81). Prior to the GFC, many companies issued bonds that were creditwrapped by monoline insurers to boost their credit rating. This practice decreased during the GFC as most monoline insurers were downgraded significantly over that period, many to ratings that were lower than the underlying ratings of the bond issuers (Black, Brassil and Hack 2010; Black et al. 2012). However, as bond spreads narrowed over 2009 and maturities recovered, corporations again sought finance in the bond market and the substitution toward bank debt began to reverse (Black, Brassil and Hack 2010).

Evidence on the extent of this recovery is conflicting. For instance, the Office of the Infrastructure Coordinator (sub. 78, attach. M) comments that total annual issuance of corporate bonds in Australia almost doubled over the last two years and has now recovered to almost pre-GFC levels (which was about $11 billion of issuance in 2013). Further, average bond tenor has lengthened from 4.7 to 6.5 years over the last two years (Westpac, sub. 51). Despite this, several participants have noted that this recovery in the bond market has been limited (Lend Lease, sub. DR201),

restricted to brownfields assets (Westpac, sub. 51; Victorian Government, sub. DR196), and that there remains reluctance among domestic bondholders to bear bid costs or s risks (Victorian Government, sub. DR196).

Opinions differ on the extent to which the monoline insurance market is still affected by the GFC. Some participants argued that the ability to creditwrap bonds remains limited, particularly for greenfields projects (Department of Infrastructure and Regional Development, sub. 64; Herbert Smith Freehills, sub. DR192; Westpac, sub. 51). Others noted that, while creditwrapping still occurs in Australia, this activity is restricted to brownfields projects (which are more likely to already be investment grade) and there remains limited appetite for greenfields projects (Westpac, sub. 51). Assured Guaranty Ltd (sub. DR128) observed that credit ratings of monoline insurers appeared to be improving, and features of the procurement process, rather than difficulties in the monoline insurance market, constrain bond financing for infrastructure projects. This is a procurement, not a financial market issue, and as such is discussed in chapter 6.

6 Financing mechanisms

Key points

- Some valuable public infrastructure cannot secure sufficient private sector support, and governments appear reluctant to fund the gap, amid concerns about public debt levels. This judgment may be open to question, and is better made on the size of the benefits potentially foregone than solely on fiscal grounds.
- Private sector involvement in financing can generate some advantages for the economy, such as through improved risk management. However, the gains from improved risk management depend on risk allocation among parties.
- Various impediments raise the cost of private sector financing, some of them specific to infrastructure. In particular, there are cases where the nature of the procurement process restricts the involvement of non-bank sources of finance in the early stages of a project.
- Most of the mechanisms proposed by participants to facilitate private sector involvement require privatisation, or are aimed at shifting the non-commercial component of the investment to governments.
- Where there is a case for government support, assistance should be provided via instruments that are simple, transparent and direct. Governments should also seek to align the funding burden of the assistance with the beneficiaries of the infrastructure.
- The case for advantaging finance for infrastructure investments via special tax treatment and for public sector guarantees of private sector debt is weak.
- The concept of an infrastructure bank — while under consideration in the United States, and active in Europe — appears to offer little benefit in addressing the identified issues in Australian infrastructure investment.
- There is merit in conducting a pilot study of a procurement process that removes the requirement for bidders to provide fully financed bids.
- 'Capital recycling' involves two separate decisions — privatisation and new investment. While this policy approach may enhance community acceptance of privatisations, especially if the sale and investment occur in the same region, it should not be used unless each of those decisions is positively supported by robust and transparent cost–benefit analyses.

The terms of reference ask the Commission to consider the rationale for, and the costs and benefits of, different financing mechanisms and suggest broad principles for the use of these mechanisms. The terms of reference also request the Commission to consider the financial risks to the Australian Government posed by

alternative funding and financing mechanisms, as well as their possible impact on the Budget and the Government's fiscal consolidation goals.

This chapter outlines an assessment framework (section 6.1) and examines the various options proposed by participants (section 6.2). Specifically, this chapter examines:

- subsidising private sector finance to bridge the 'financing gap' (section 6.3)
- superannuation fund liquidity issues (section 6.4)
- distorted incentives in the procurement process (section 6.5)
- capital recycling (section 6.6).

6.1 Assessment framework

Misconceptions about private and public financing sources

Chapter 3 identified the main benefits and costs of private sector involvement in infrastructure provision and financing.

As discussed, the key potential gains arise from:

- better incentives, discipline and expertise in managing various commercial risks during the project's construction and operation
- improved discipline on the investment decision.

Conversely, the major costs relate to:

- hidden contingent liabilities — contracts with a private sector partner often introduce costs or obligations on the government, which are generally not fully reflected on the government balance sheet and thus may distort decision making about the financing method
- higher transaction costs and contracting difficulties.

The above are the key factors that should inform a decision on whether to involve a private sector financier, the extent of that involvement, and the arrangements to govern it.

On the other hand, there are a number of misconceptions about the consequences of selecting a particular source of finance, which are sometimes used in the public discourse to justify particular policy choices. These are explored below.

Can private financing improve the government's long-term fiscal position?

An argument that is sometimes advanced to support the use of private capital instead of government borrowing or fiscal surplus is that this would increase the 'pool' of funds available for infrastructure investment (for example, Transurban, sub. 61).

However, the impact on a government budget needs to be assessed over the life of the project. If a public private partnership (PPP) imposes non-contingent obligations to make future payments to private sector providers, then this creates a liability that needs to be funded from taxes and/or user charges. This has a similar impact to direct government borrowing. All else equal, the replacement of public finance with private finance does not create a new source of funds or value — the expected value of a project over its life remains unchanged. In this sense, there is no magic pudding from private sector involvement in the long term.

In practice, the government's budget position may deteriorate, improve or remain unchanged after all impacts have been netted out. How these outcomes affect the budget position will depend on the funding model chosen, the allocation of risks between the government and the private provider (and in turn, its financier), and the actual performance of the infrastructure asset. However, governments can be certain of one thing — the outcome will not simply be a creation of new funds, with no offsetting impacts.

A further complication arises from the inter-jurisdictional taxation arrangements in Australia's federal system of government. For example, in some cases a State Government may benefit from tax deductions on interest paid to service debt by private providers. These transfers would not occur if the project was financed by the State Government.

Notwithstanding all of the above, private financing could allow governments to overcome self-imposed *short-term* fiscal or debt constraints and fund priority infrastructure projects that would otherwise be stalled. However, to the extent that they replace a thorough assessment of the relative merits of public and private sources of finance, any self-imposed constraints on public financing risk generating second-best outcomes.

Can user charging overcome self-imposed constraints on public finance?

A similar argument to that in the previous section is that greater user charging could be used to overcome fiscal and debt constraints on the government. User charging is less likely to cause second-best project outcomes than self-imposed debt constraints.

It can provide a revenue stream to recoup operating costs and the cost of the initial investment over time. To the extent that greater reliance on user charging is feasible, this can facilitate additional investment in public infrastructure through private financing. This could increase the level of infrastructure investment for a given level of government taxation and borrowing.

However, user charging cannot be relied on to fully address the underinvestment caused by government fiscal constraints, because it could only be used to recover the *private* benefits that accrue to users of infrastructure. It is not an effective mechanism for recovering the benefits to non-users. As discussed in chapter 1, many infrastructure projects have 'public good' characteristics. In those cases, private sector involvement in financing would generally only become commercial with some form of subsidy from government. This could take the form of a transfer of some costs or risk to government on the financing side, or on the funding side. Financial engineering to design a new financing instrument or model will not resolve the issue, in the absence of implicit or explicit support from government to cover the gap between the public and commercial value of the project.

Ultimately, for infrastructure projects that are currently not going ahead due to lack of public funding to compensate for their public good characteristics, the policy choice is to provide funds to the project, or to accept a lower level of infrastructure provision and service.

Does public sector debt have a lower cost of financing than private sector debt?

It is often argued that public sector finance is cheaper than private sector finance because the government's cost of borrowing is lower than the private sector's cost of capital for PPPs. Estimated differences are between 100 to 300 basis points and this, as argued by The Australia Institute (sub. 85), could potentially add another 50 per cent to the cost of a project (Yescombe 2007). Given this lower cost of financing, some argue that the Australian Government should use its AAA credit rating and lower cost of funds to finance infrastructure projects, particularly in a time of low interest rates (The Australia Institute, sub. 85).

Although government borrowing is likely to generate explicit financial savings in the form of a lower interest rate, the interest rate on government borrowing is lower because financial markets have factored in taxpayers providing a guarantee for the risks of publicly financed projects. In effect, when a government borrows at a 'risk-free' rate, the taxpayers bear the cost of the interest repayments *and* a contingent liability for the risk that has not been reflected in the interest rate.

A further argument in support of government financing is that the government's cost of capital is lower because it has a better ability to handle risks associated with infrastructure projects through the capacity to 'pool' risks over a larger number of projects and 'spread' risks over all taxpayers (Arrow and Lind 1970; Quiggin 1996, 2002). However, well-developed private capital markets also provide opportunities for risks to be pooled and spread efficiently (Brealey, Cooper and Habib 1997). Financial markets can spread risk globally in a way governments cannot. For example, PPPs are often financed by bank syndicates, which allows individual banks to limit their exposure to individual projects and to diversify the risks in their loan portfolios geographically and across sectors.

Notwithstanding the above, public sector borrowing could generate savings for the taxpayer where the private financing market is uncompetitive and financiers are exploiting their market power. In these situations, competition from public financing could put pressure on private sector margins. However, even then, public financing may not be the optimal approach. There may be opportunities to increase competition within financing by removing impediments to entry to alternative sources of private finance (discussed in section 6.5).

Is public sector debt inherently undesirable?

A common public perception is that trends of increasing government debt levels are synonymous with financial imprudence and hence, inherently undesirable. However, when governments are considering whether or not to borrow, it is important to consider for what purpose the funds will be used and the base level of indebtedness.

As discussed in chapter 2, governments deciding whether or not to proceed with a project should conduct a transparent cost–benefit analysis. If the government has, through a cost–benefit analysis, ascertained that there are sufficient net benefits to the community, the next question is how the project will be financed. As discussed earlier, there are a range of considerations dictating whether or not public sector or private sector finance is the most efficient option. Moreover, some projects cannot be financed privately due to their public good characteristics.

If the government decides to finance the project itself, it has three choices — reduce expenditure, increase taxes, or borrow. It may use a combination of these. However, government borrowing must be serviced in the future. Again, governments can only service debt through reducing expenditure, raising taxes or using the revenues generated by the project (if any). Thus, government borrowing and taxation are effectively equivalent in the long run, and the decision to finance a project from

government debt or existing budgetary resources is essentially a question about whether or not the project should be paid for upfront or in the future.

There are a range of factors that governments should take into account when deciding whether current or future generations should pay higher taxes. One is intergenerational equity. In this context, it is not self-evident that shifting the funding burden on future generations is inequitable. A common argument is that future generations will be better off than current generations, not only because of rising real incomes, but also because they will have the use of the infrastructure built by today's generation (provided the infrastructure has been appropriately selected and maintained) (Freebairn and Corden 2013). In this context, it may be preferable to borrow now and raise taxes later. However, the extent to which this is the case would vary from project to project.

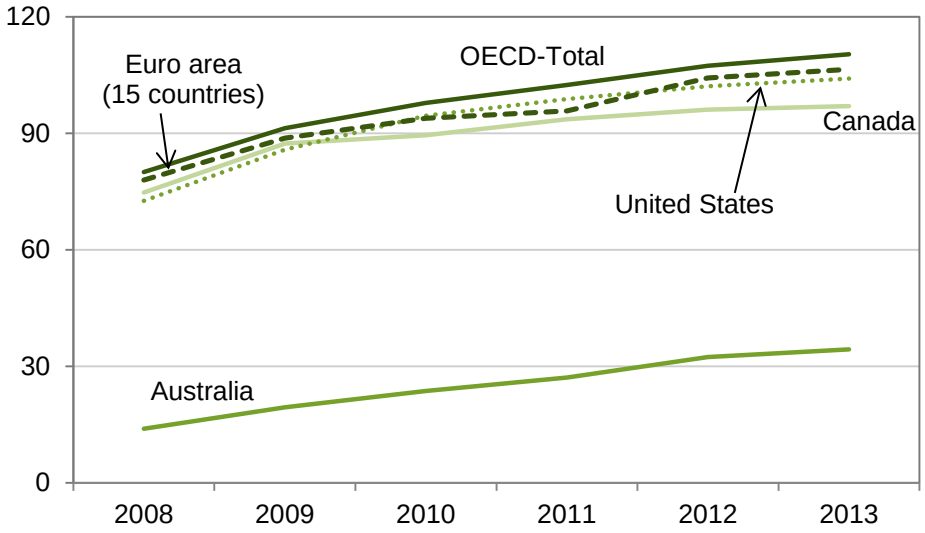
As discussed above, there are a range of sources available to the Australian and State and Territory Governments to finance and fund infrastructure investments. Furthermore, the Australian and State and Territory Governments enjoy favourable sovereign risk ratings from the major rating agencies. For example, in the current Standard & Poor's ratings, the Australian Government has a AAA rating, and all State and Territory Governments have ratings at or above the AA level (Standard and Poor's nd). Australia's debt levels relative to its gross domestic product are generally lower than in most developed economies (figure 6.1). This is not to argue that the debt levels currently prevailing in those economies are optimal, or that the Australian Government should seek to substantially increase its levels of debt. The key point is that there is no apparent constraint on Australian Government borrowing, if the proceeds are used in a way that would deliver a demonstrable net public benefit.

At the local government level, there is also some evidence of debt aversion (EY 2012). For example, Comrie (2014) found that across Australia, local governments tend to have low levels of debt relative to the asset intensive nature of services provided, and the secure income streams available to councils. On average, councils had more money in the bank than debt. Comrie attributed the outcome, in part, to various guidelines and technical advice issued at state and territory level discouraging the use of debt by local government, and in the case of Tasmania, a State Government limit on local government borrowing.[16] Other State Government policies may also be at play. For example, the Local Government Association of Queensland noted the capping of rates by the Queensland Government

[16] That said, the Institute of Public Works Engineering Australasia (Queensland) noted that debt aversion did not seem to be an issue for Queensland local governments (trans., p. 225). The Local Government Association of South Australia (sub. DR200) made a similar point with respect to its constituents.

(trans., p. 234), which could influence the debt servicing capacity and raise the price of debt to a local government.

Figure 6.1 **Gross government debt as a percentage of GDP for selected economies**[a]



a Gross government debt is defined as the short and long-term debt and other liabilities of all institutions in the general government sector, subject to data availability. The general government sector is defined in accordance with the United Nations System of National Accounts 1993 and includes central, state and local government. For the United States, Flow of Funds estimates are used, which value debt at face value. The gross data are consolidated within and between the sub-sectors of the general government sector, national sources permitting.

Source: OECD (2013).

Comrie concluded:

> Under-use of debt will … result in inter-generational inequity in service provision and charging decisions, and/or an inability to accommodate needs and preferences for new capital works and asset renewal.(Comrie 2014, p. i)

In sum, Australian governments have the capacity to fund and finance higher levels of infrastructure provision than currently provided for under existing fiscal and debt management practices. Use of this capacity is justifiable for projects of high net social benefit but of lower commercial value to the private sector. However, proper assessment of projects and efficient delivery is crucial. The implementation of the Commission's proposed package of reforms is essential to achieving value for money on behalf of the community, especially if governments decided to increase their borrowings to fund and finance additional public infrastructure.

FINDING 6.1

Where project selection decisions are made in accordance with the framework recommended in this report, there is additional capacity for the Australian and State and Territory Governments to finance public infrastructure through borrowing.

Impediments to private sector financing — policy relevance and application

A common view from a wide range of participants is that there is no shortage of private capital for public infrastructure projects, from either debt or equity markets (HSF, sub. 68; Westpac, sub. 51; Lend Lease, sub. 46; Department of Infrastructure and Regional Development, sub. 64; BCA, sub. 39). Further, as outlined in chapter 5, significant levels of private investment have already taken place in a range of infrastructure sectors in Australia, and by a wide range of private investors. Nevertheless, many participants have provided views on impediments to greater provision of private sector finance (table 6.1).

Broader issues are best addressed comprehensively

Some of the impediments raised by participants relate to broader factors within Australian and international financial and capital markets. Some also relate to other areas of policy that interact with the private sector's willingness or ability to finance public infrastructure. These include general taxation issues and broader regulations governing the operations of superannuation funds. Where those impediments create a barrier to efficient private investment, and to the extent that a policy response is warranted, the optimal approach is to address them at their source after assessing the broader costs and benefits of all alternatives. Designing specific instruments that only address the impediments insofar as they relate to investment in infrastructure is likely to be a second-best approach. This is particularly so, where other processes — such as the current Financial System Inquiry (the Murray Inquiry) — are in train to address the issue more comprehensively. This issue is discussed further in section 6.2.

Table 6.1 **Participants' views on impediments to infrastructure financing**

Category	*Type of impediment*	*Participant(s) who raised/discussed*
Issues in private financing markets	Australia's relatively limited and illiquid corporate bond market for infrastructure finance	HSF (sub. 68); Westpac (sub. 51)
	Current gap in commercial credit reinsurance markets (for greenfields infrastructure in particular) due to exit of monoline insurers	Pottinger (sub. 8); HSF (sub. 68); BCA (sub. 39); Victorian Government (sub. 81)
	Greater reliance on shorter-term bank debt for financing new projects. Sourcing finance at appropriate cost and tenor, and in sufficient volume for major projects, is challenging in the current environment. This also has implications for equity investors because it increases transaction costs associated with refinancing	BCA (sub. 39); Lend Lease (sub. 46); Victorian Government (sub. 81); OIC (sub. 78); Pottinger (sub. 8); HSF (sub. 68)
Lack of private sector appetite for greenfields project risk	Commercial failure of recent toll road projects where patronage risk is allocated to private sector	Pottinger (sub. 8); AMP Capital (sub. 86); HSF (sub. 68); BCA (sub. 39); Westpac (sub. 51)
	Greenfields infrastructure not aligned with requirements of superannuation funds and other institutional investors. Superannuation funds preferring brownfield to greenfields ones	AMP (sub. 86); Westpac (sub. 51); Transurban (sub. 61)
Liquidity requirements facing superannuation funds	Liquidity requirements facing Australian funds limit allocations they can make to illiquid investments, such as infrastructure. Influenced by factors specific to the Australian context, including greater reliance on defined contribution schemes, portability rules which allow members to switch funds within 30 days and lump sum payment 'cliff' at end of accumulation phase	BCA (sub. 39); Cbus (sub. 67); ISA (sub. 60)
Taxation issues	Lack of tax incentives for entities that invest in a nationally significant infrastructure project	BCA (sub. 39); Lend Lease (sub. 46)
	Need for further taxation reform, including stamp duty reform	BCA (sub. 39); LGAQ (sub. 52); AMP (sub. 86); Lend Lease (sub. 46)
Lack of a clear project pipeline	Volatile and geographically dispersed deal flow	ISA (sub. 60)
	Need more information on future projects and funding commitments	Cbus (sub. 67); Maritime Super (sub. 15); DIRD (sub. 64)
	Difficult for some types of investors to retain necessary in-house capability in Australia	DIRD (sub. 64); BCA (sub. 39)
Inefficiencies in the bidding process	PPP bid processes are costly. Bids have to be fully financed — cost of participation is particularly high for non-bank sources of finance	ISA (sub. 60); Cbus (sub. 67); Assured Guaranty (sub. DR128) Transurban (sub. 61); Lend Lease (sub. 46); BCA (sub. 39)
	Lack of specialist skills in smaller superannuation funds, limiting direct participation in the bidding process	

Global financial crisis, risk-based market gaps and the role for government

A large volume of comment referred to high project risk as an impediment to private sector participation in greenfields public infrastructure projects. Consequently, many of the mechanisms and instruments proposed by participants, in essence, presented different ways to transfer some of the project risk from the private sector to the government.

A related theme in many submissions was that the global financial crisis (GFC) affected the operation of financial markets, particularly through the increase in the price of risk. Some have argued global financial market conditions contributed to difficulties in financing PPPs, particularly through certain types of instruments, such as corporate bonds (chapter 5). Participants have also argued that reduced activities of monoline insurers have created a structural gap in the market for debt reinsurance (HSF, sub. 68; Norton Rose Fulbright, sub. DR134; Financial Architects Asia, sub. DR191).

Evidence on the magnitude of problems and the recovery from the GFC is mixed. There are some indications that global levels of infrastructure lending have largely returned to pre-GFC levels (chapter 5), although in most markets credit insurance is not available to the extent it was prior to the GFC. That said, the higher price of risk could still have affected the composition of investment with a shift to less risky projects.

More importantly, caution needs to be exercised when determining an appropriate role for government in the context of the unwillingness of the private sector to accept some risks. The lending and investment levels and prices that prevailed immediately prior to the GFC are at best a debatable benchmark for judging a recovery in the financial markets. Nor should they be uncritically used to assess the appropriate extent of government involvement in financing. There is a substantial body of literature and comment that identifies under-priced risk and excessive levels of lending as one of the *causes* of the GFC (Andersson and Vanini 2009; Beirne and Fratzscher 2013; Debelle 2010). As such, any repricing of risk that has occurred may have improved economywide outcomes.

More generally, the unwillingness of the private sector to commit to higher risk projects may be a commercially and economically sound decision. The Commission has previously examined the potential problems arising from government provision of finance solely on the basis of perceived 'market gaps' (PC 2012a). As discussed in chapter 3, allocation of some project risks from a private sector partner to the government may be warranted if the government is better able to avoid, manage or absorb those risks. However, this sets a substantially higher threshold for

government involvement. That said, as the Commission has noted in relation to export credit markets, there may be circumstances where financial markets are disrupted that justify temporary intervention in markets (PC 2012a).

As a general principle, government support of private finance may be warranted when a socially beneficial project is uncommercial because of the public good nature of the benefits or because the project is motivated by equity considerations. The subsidy can take various forms and be applied at different stages of the project, depending on the context. The key considerations include determining the appropriate level of government support, and identifying the most direct way of applying it to achieve the objective at least cost. This underscores the importance of appropriate institutions and processes for project selection (chapters 2 and 7), and in particular, the role of transparent and robust cost–benefit analysis.

Criteria for assessing alternative financing mechanisms

Broadly speaking, there are four factors that capture the differences between financing approaches:

- risk allocation and management
- transaction costs
- exposure to market or other disciplines
- equity considerations.

The role of the financing mechanism in risk allocation and management

Risk management is the key determinant of the efficiency of the investment. All of the financing instruments, although differing in their mechanics, have as their main objective the allocation of risks and costs across time and between parties.

To the extent that commercial negotiation of financing includes instruments or arrangements that shift risk to the government, such as guarantees, no government can afford to be complacent. As long as the decision to allocate project risks between the government and private sector is undertaken independently of the choice of the financing mechanism, each of the different aspects of risk will be made transparent. The primary function of financing should not extend beyond financing the project at the lowest sustainable cost for a given allocation of risk. In this context, the choice of a particular financial instrument or vehicle is subsidiary to appropriate project selection and design as well as the decision on the *extent* of

government involvement. Put simply, financial engineering to shift risk away from the intended allocation in project design is unwise.

That said, several participants have highlighted some areas of financial design where policy could play a role, because investment risks and ultimately costs and benefits of a project are influenced by decisions at the financing stage. Two issues that attracted significant comment related to capital structure and the tenor of debt finance.

Capital structure and risk management

Different types of capital lead to different approaches and incentives for dealing with risk. Several participants argued that equity financiers have stronger incentives to manage the project's risks, but less opportunity to manage it, than bank financiers that typically dominate the financing in the early stages of greenfields PPP projects (ISA, sub. 60, sub. DR150; IFM Investors, sub. DR184).

This argument is consistent with conventional economic principles on *corporate* financing and applies, for example, in areas such as a privatised airport or an electricity utility. The risk-return management includes selecting the capital structure that maximises the value of the corporation. In this scenario, debt providers are only exposed to risk of default and have little if any capacity to capture the value to the firm from managing investment risks (and hence little incentive to perform this function). Thus, debt providers play a more passive role in corporate governance.

However, there is a substantial literature on *project* financing, which indicates that the roles played by equity and debt in this organisational structure differ from those in corporate financing (Blanc-Brude 2013; Brealey, Myers and Allen 2014; Esty 2004). Some key features of project financing could lead to debt playing a more active role in managing project risks.

First, project financing is characterised by a high level of gearing — around 70–75 per cent on average, and sometimes as high as 99 per cent (Blanc-Brude 2013; Esty 2002). In part, this is made possible because at the outset, the risks had been transferred out of the special purpose vehicle (SPV) through various off-take agreements, arranged by the financiers in the consortium (both equity and debt providers). High gearing increases the sensitivity of debt holders to project mismanagement.

Second, the non-recourse nature of project financing means that debt holders have a more direct exposure to default risk and are not 'insured' by the balance sheet of the corporate sponsor (Kleimeier and Megginson 2000).

Third, project financing typically involves complex consortia with multiple disparate parties that often face conflicting incentives — banks may have a greater capacity to play a disciplinary role in managing those conflicting incentives in a way that minimises default risk (Blanc-Brude 2013; Esty 2002).

Finally, the 'lead arranger' position within a project finance structure allows the bank to charge fees to capture some of the value it can bring to the project through risk management — to the extent that a bank may have a comparative advantage in such activity, this creates an incentive to engage in risk management that goes beyond managing default risks (Yescombe 2007).

There is some evidence that bank providers of infrastructure finance have historically played an active role in the management of project risks.[17] Moreover, the general experience of large greenfields infrastructure projects in Australia is that the senior debt and project finance arrangers exercise significant control in the development and early phases of the project. What is not clear, however, is whether these parties are genuinely best placed to manage the project risk. Moreover, to the extent that other parties, particularly equity providers (but also project participants that are external to the special purpose vehicle) are not fully involved in risk management, inefficient outcomes would be more likely to occur.

Hellowell and Vecchi (2012) argued that both debt and equity have valuable but distinct risk management roles within a project's capital structure. Specifically, debt holders have a higher priority claim on cash flows and can also typically step in to claim the assets of the sponsor in cases of sustained poor performance, at which point they become equity owners. Thus, debt investors have a 'regulatory' role to assess the robustness of the project planning, allocate risks to appropriate firms within the private sector counterparty, monitor performance and step in to manage problems. On the other hand, equity holders, with a lower priority claim on project cash flows and a greater risk that the project will fail to achieve its expected return, have a strong incentive to act as integrators and managers of construction and operations (table 6.2).

[17] For example, Brealey and Myers (1986) provided a case study of the extensive risk management activity undertaken by a bank syndicate in the course of the development of the North Sea oil fields in 1970s — one of the first examples of modern project finance.

Table 6.2 **Risk management roles within a conventional project finance capital structure**

	Construction	*Operations*
Debt	Discipline in risk analysis/allocation Due diligence (upfront) Monitor and provide discipline on equity (Step-in)/sort out failing projects	Discipline in risk analysis/allocation Due diligence (ongoing maintenance) Monitor and provide discipline on equity (Step-in)/sort out failing projects
Equity	Integration of design and build Management of construction risk Dealing with problems on failing projects Commit additional equity if required	Integration of design, build and operate Long-term performance management Dealing with emerging problems Commit additional equity if required

Source: Hellowell and Vecchi (2012).

In sum, the dominance of debt in the early stages of project finance may not necessarily represent a policy problem, because project financing involves a specific organisational arrangement, and the standard assumptions of corporate finance may not apply. There may, however, be a role for policy if current outcomes are a product of market conditions or government policies (for example, tender requirements) that impede competition from alternative sources of finance and distort the resulting financing outcomes.

Refinancing risks and costs — finance tenor and the choice of financial instrument

A number of participants argued that short tenor debt, which currently constitutes the bulk of finance in early stages of greenfields projects, creates excessive refinancing risks and consequently inflates lifecycle financing costs. Several participants also observed that a greater role should be played by longer-term instruments, such as bonds. Queensland Investment Corporation (QIC) noted:

> For an infrastructure borrower, the development of this alternative is overdue — the bank loan market does not typically provide loans of more than seven years tenor and offshore financing has certain limitations that prevent it from being a complete solution to the problem. Infrastructure issuers need longer duration domestic debt to lower their refinancing risk and cost of equity. (sub. DR147, pp. 15–16)

The shift to shorter-term financing is at least in part a consequence of the repricing of the liquidity risk by financial institutions following the GFC and the resulting change in the composition of their assets (chapter 5).

Refinancing risk comprises a bundle of risks that together contribute to the risk of the price of new finance being different on maturity of the existing financial instrument. These include changes in broader market conditions affecting the price of finance for a given level of risk, but also project-specific factors where the project has not performed as expected after initial financing was procured. The

latter is particularly important for greenfields projects, which carry a high risk at the beginning of the project's life (chapter 5). In those cases, refinancing *could* represent a point at which substantial unforeseen losses (or gains) are realised.

However, maturity of the financial instrument is not necessarily the point in time at which such losses would be incurred. For example, the value of a long-term bond is typically reassessed by rating agencies throughout its life. This could adversely affect both the bond holder and the issuer, by increasing the cost of other components of finance to the project. Furthermore, to avoid the downgrading of the bond value, bond holders may seek to explicitly transfer the risks back to equity by requiring a surety bond or a debt service reserve account to finance future repayments (Miller 1996).

Some of the refinancing risks may be transferable through longer-term finance instruments. For example, for fixed coupon bonds, holders would assume the risk of interest rate movements. However, in this case, the price of finance would reflect this. Conversely, if in the case of shorter tenor instruments, the borrower bears a greater share of risks associated with the future cost of finance, the price of finance would reflect this allocation.

There is no a priori reason that the tenor of the financing should align fully with the tenor of the asset. However, the transaction costs associated with very early refinancing, before project risks have altered significantly, can add materially to project cost for little benefit. That said, given most infrastructure assets have lives measured in decades and the tenor of debt is generally measured in years, refinancing is an inevitable and strategically important issue for infrastructure projects. Moreover, refinancing risk does not disappear, but is deferred, with important consequences for a business case via discount rates, for example with the switch from short to long-term financing.

A bias to short term bank finance during the high risk construction and ramp-up stages of a project may be rational if linked to the timing when risks alter.

The dominance of shorter-term bank finance in the early stages of a project over longer-term debt instruments, such as bonds may, in part, reflect the flexibility of the former when operating in the context of a high risk of default. Where a debt restructuring is required, banks are typically able to achieve this quickly. On the other hand, for bondholders, restructuring would often trigger a complex and time-intensive process of selective bond defaults (Ehlers, Packer and Remolona 2014). More broadly, their different characteristics may give bank loans and bonds advantages in particular contexts (box 6.1). That said, the availability of

finance of a range of maturities could contribute to more effective debt management practices.

Box 6.1 **Bank loans and bonds — some key differences**

- *Tenor* — bond finance is generally available over longer tenors than loan finance.
- *Risk preferences of providers* — institutional bond investors typically require an investment grade rating, which may not be achievable for an unwrapped infrastructure bond at the beginning of a project.
- *Commitment period* — banks typically commit to lend substantial sums (by reserving lending capacity) over longer availability periods than bond markets.
- *Flexibility* — bank loans are more flexible when sale of the project or renegotiation of repayments and loan restructuring are required.
- *Allocation of responsibility for decision making* — convening a meeting of bond-holders is a costly and expensive process. Most of the decision making is typically outsourced to a trustee company or a monoline insurer. The bond covenants themselves are flexible, to ensure that bond holders are only engaged in rare events. By contrast, banks typically impose and enforce strict prescriptive covenants on loan contracts.

Sources: Ehlers et al. (2014); Yescombe (2007); Chan et al. (2009); Esty (2002); Vinter et al. (2013).

In sum, as in the case of capital structure, in the absence of policy impediments or market failures, the tenor of finance and the selection of the most appropriate instrument is an issue for the market to resolve. Abnormal circumstances, such as have occurred in recent years with the GFC, may be of policy significance to the extent that the market adjustment is characterised by overshooting. However, while undesirable for a particular project, temporary overshooting is a feature of financial markets, and the consequences can be quite difficult for policy to address. Indeed, government intervention itself can lead to unexpected consequences and distort the incentives within the market to adjust to the correct supply level and price of finance.

Transaction costs

Transaction costs include the cost of contracting, arranging and managing finance, and costs associated with delay or risks with availability of finance. Important considerations include the level of complexity of the instrument, whether it is an established instrument in the financial markets, and the capability of the public sector to administer it.

As noted earlier, high transaction costs, specifically those that arise out of the current bidding process, have been identified by some participants as a barrier to participation in infrastructure investments.

Exposure to market or other disciplines

The choice of financing instrument can affect investment discipline through enforcing government fiscal responsibility and governance, or through introducing market scrutiny to the investment (Chan et al. 2009).

In the context of government fiscal responsibility and governance, key attributes are the instrument's transparency and exposure to Parliamentary and public scrutiny. In this case, on-budget mechanisms generally have the advantage. Off-budget financing mechanisms place greater pressure on other governance structures, such as ministerial and regulatory oversight of Government Trading Enterprises (Chan et al. 2009).

In the context of market discipline, in deciding on which instrument to use and (potentially more importantly) how it is applied, one needs to be mindful of the signals sent to market participants. Specifically, where the private sector is involved, the financing should expect to see some risks retained by the private investor. A financing arrangement that reflects this risk transfer would be more likely to avoid moral hazard problems.

Equity, distributional and timing considerations

The distribution of the costs and benefits of infrastructure investments and, specifically, ensuring that, where possible, the costs of providing infrastructure services are borne by the beneficiaries, is largely a funding/charging matter rather than a financing issue (chapter 4). Nevertheless, financing can be affected by these considerations. Specifically, to address intergenerational equity, the incidence of the benefits from the use of infrastructure and the charging for those benefits need to be somewhat aligned over time. In this context, the nature of the financing would influence the fiscal/cash flow outcomes. Matching the temporal profile of the financing with the funding requirement could result in fiscal smoothing and reduce the size of budget surpluses and deficits across time.

6.2 Mechanisms discussed by participants

Participants raised and discussed a number of financing mechanisms and options (table 6.3).

Table 6.3 **Alternative financing mechanisms**

Category	*Potential mechanism*	*Participant(s) who raised/discussed*
Targeted payments and government loans	Government capital grants	Victorian Government (sub. 81)
	Concessional loans	DIRD (sub. 64)
	Subordinated debt	DIRD (sub. 64)
Government infrastructure bonds	Tax preferential infrastructure bonds	Housing Industry Association (sub. 21); Committee for Melbourne (sub. 30)
	Converting infrastructure bonds	Pottinger (sub. 8)
	30-50 year Commonwealth bonds	BCA (sub. 39); Property Council of Australia (sub. 53)
Financing guarantees	Infrastructure Fund	HSF (sub. 68)
	Direct government loan guarantees	DIRD (sub. 64)
	Establish government credit reinsurance provider	Pottinger (sub. 8)
	Extending RBA repo eligibility	Assured Guaranty (sub. 29)
Availability payments	Availability payments	Victorian Government (sub 81); ISA (sub. 60), Bianchi and Drew (sub. 33); AMP Capital (sub. 86); Hale (sub. 2)
Superannuation fund liquidity issues	Super fund senior debt facility	Maritime Super (sub. 60)
	Liquidity guarantee	Cbus (sub. 67); ISA (sub. 60)
	Temporary relaxation of prudential rules on liquidity	Cbus (trans., p. 45)
	Liquidity pool mechanism	Cbus (sub. 67); ISA (sub. 60)
Inefficiencies in the procurement process	Inverted bid procurement model	ISA (sub. 60); Cbus (sub. 67); IFM Investors (sub. DR184).
	Financing competition model	Assured Guaranty (sub. DR128)
Financing from brownfield infrastructure sale proceeds	Capital recycling model	Consult Australia (sub. 23); Committee for Melbourne (sub. 30); Bianchi and Drew (sub. 33); CME (sub. 36); Katz (sub. 45); Lend Lease (sub. 46); Westpac (sub. 51); Property Council of Australia (sub. 53); BCA (sub. 39); AIG (sub. 47); The Australia Institute (sub. 85); AMP Capital (sub. 86)

For its assessment, the Commission has grouped the proposals into four broad categories on the basis of the policy problem they are intended to address:

- delivering a subsidy to bridge the gap between the public and commercial value of the project

- dealing with regulatory and policy impediments affecting investment by superannuation funds
- addressing inefficiencies in the procurement process
- addressing the governments' self-imposed funding constraint.

6.3 Subsidising private sector finance to bridge the 'financing gap'

The threshold step for any assessment on the merits of subsidising the financing or funding of infrastructure projects is the question of the underlying rationale for government involvement. The valid rationales for government support were discussed in chapter 2 and section 6.1, and the following discussion of potential forms and delivery mechanisms assumes that a government subsidy is warranted on net public benefit grounds.

Direct provision of finance — targeted payments and subsidised loans

Direct provision of finance by the government is the traditional method of financing public infrastructure projects.

Participants focused on two forms of direct provision:

- non-repayable capital contributions (grants)
- government debt/loans.

Participants also discussed potential ways of administering such grants and loans including:

- some form of government-established 'infrastructure bank' which provided loans (and other forms of credit enhancement) to eligible infrastructure projects on an arms-length basis from government (Committee for Melbourne, sub. 30; Hepburn, sub. 57).
- a national infrastructure fund (Herbert Smith Freehills, sub. 68; Australian Constructors Association Limited, sub. 72; Victorian Government, sub. 81; Regional Australia Institute, sub. 92) (discussed in chapter 7).

Capital grants — details of the instrument

Capital grants could involve the Australian, or State and Territory or Local Governments making a targeted (and partial) capital grant to support the raising of

private financing for an infrastructure project. This can take a variety of different forms, including as milestone payments during the construction period, or a lump sum payment once construction is complete (Victorian Government, sub. 81). Partial targeted capital grants have been used within PPP financing structures, at the Australian and state government level in Australia, as well as in other countries (box 6.2).

Box 6.2 **Targeted capital contributions within a PPP**

Victorian Comprehensive Cancer Centre — An Australian Government grant (of $428.5 million) was provided to the private consortium developing the Victorian Comprehensive Cancer Centre PPP. The grant funding was used as a capital contribution paid directly to the private consortium to avoid the potential increase in liabilities on the Victorian Government balance sheet if the Australian Government funding was passed through the State.

Gold Coast Rapid Transit — A grant of 45 per cent of the total capital cost was provided to the PPP operator during the construction period.

NSW Convention Centre — A grant of a percentage of the investment cost was provided to the PPP operator post completion of construction.

Canada Infrastructure Ontario project — A grant of 30-80 per cent of the projects' costs was made post completion of construction.

Canada British Columbia projects — A grant of 40-60 per cent of the projects' costs was provided during construction.

Sources: BCA (sub. 39, attach); Victorian Government (sub. 81).

Government debt/loans — details of the instrument

This mechanism involves the government becoming a lender to the project proponent (whether a private sector proponent or a lower level of government) through the provision of debt capital. A government loan or the raising of debt to support the financing of an infrastructure project could be structured in various ways. Mechanisms proposed by participants include:

- A *concessional loan* where the Australian (or a State/Territory) Government provides a project proponent with a loan directly. This could be provided at a lower interest rate and for longer tenor than offered in the market.
- A public sector *subordinated note* where the government issues subordinated debt which would be repaid if the project performs as expected. Under this type of mechanism, which has been used in Australia and overseas, the level of private sector gearing could be increased in later phases of the project when the

asset's performance is more stable. It could also be designed so a government would share in the future upside if revenue performance is better than forecast (BCA, sub. 39).

- Various other forms of debt have been suggested, such as a government providing a portion of senior debt from commencement of a project or once construction is complete, or the government providing all debt in the early phases with the private sector only contributing equity (Victorian Government, sub. 81).

Commission's assessment

Direct government financing can have some advantages over less direct instruments, such as guarantees. Specifically, the instruments are a relatively transparent and accountable form of facilitating private sector investment, and consequently would be likely to impose greater investment discipline on the government.

Furthermore, both approaches are currently widely used, and as far as the financing mechanism goes, do not involve a complex arrangement. Thus, the transaction costs for the parties are likely to be relatively low.

Assessed against each other, the two approaches have some advantages and disadvantages.

A capital grant would be a more direct way of targeting gaps in finance that arise due to the public good nature of the project. Furthermore, depending on the size of the gap between commercial and public benefits, capital grants may be a more effective way of addressing it than concessional loans, because the latter may not be able to incorporate a sufficiently large subsidy element to bridge the gap. It is likely that for projects with no user-based revenue stream, a government concessional loan would still need to be supplemented by an availability payment.

The implications of the two approaches for market and government discipline are more ambiguous. Targeted capital grants equate to a more explicit subsidy than a subsidised loan issued to a consortium. This could encourage unproductive rent-seeking behaviour by project sponsors. However, the Commission has in the past found that Government lending was not completely immune to this problem — for example, see PC (2012a). Moreover, the explicit nature of the grant instrument would make it a more transparent form of assistance than a concessional loan, where the subsidy element is less easily identifiable.

Government loans, by virtue of requiring repayment over the life of the loan create a greater risk-management incentive for the recipient than a non-repayable capital grant. However, they may give the government less flexibility to withdraw from a poorly performing investment. The adverse balance sheet consequences from writing off a bad loan could create an incentive for the government to 'throw good money after bad' and continue supporting a failing investment when it is not economically efficient to do so. Conversely, a capital grant approach may be a more effective way of setting the boundaries of government support, because it is easier to treat capital grant funds as sunk.

From an administrative cost perspective, targeted grants are likely to be a less costly mechanism than loans, which require ongoing administrative engagement from the government and may ultimately still finish as grants if the borrower defaults. This is not necessarily an argument for a one-off lump sum contribution from the government. An arrangement of staggered payments linked to project milestones and conditional on performance targets or some other form of amortisation, may on occasion represent a more efficient allocation of risks. The approach of disbursing the subsidy as a stream of payments would also have the advantage of keeping the subsidy in the public eye over a longer period.

Overall, the Commission considers that assuming the case for government support is made, capital grants offer a more clearly delineated, transparent and effective way of delivering that support than concessional loans.

Infrastructure Bank — the costs are likely to outweigh the benefits

Several participants suggested that direct government provision of finance could be administered more efficiently via a public 'infrastructure bank', which provided loans and other forms of credit enhancement to eligible infrastructure projects on an arms-length basis from government (Committee for Melbourne, sub. 30; Hepburn, sub. 57). Participants argued that this approach could generate several benefits including:

- increasing the pool of funds available for infrastructure investment and filling the gaps in private sector finance
- reduced transaction costs through improved procurement processes and the development of public sector expertise in infrastructure financing
- the ability to diversify and spread specific project risks across a wide pool of infrastructure assets through the infrastructure bonds issued by the bank.

However, the pool of funds available for infrastructure and the extent of government involvement in funding are a distinct issue from how those funds are

administered — an infrastructure bank is not a pre-requisite for increasing government funding. Likewise, there are several ways of reducing transaction costs and improving procurement that do not involve the setting up of a new entity. Finally, the ability to diversify the risks from government involvement is likely to be greater when those risks are spread across taxpayers, rather than just the infrastructure class of assets (which would be the case unless the bank was underwritten by the Government).

The Commission notes that a facility like the proposed infrastructure bank is under consideration in the United States, and that the European Investment Bank fills a perceived need for an infrastructure-specific investment role in Europe.

However, the Commission can see risks associated with government ownership of a bank. Since the 1990s, the financial system in Australia has largely moved away from government ownership of financial institutions, in some cases prompted by the financial mismanagement and/or collapse of institutions, such as the State Banks of South Australia and Victoria. Over the years, various attempts by the Australian and State Governments at operating publicly funded economic development operations have also ended in failure.[18] International research previously cited by the Commission (2012a) indicates that government ownership of financial institutions is associated with slower subsequent financial development and lower productivity growth.

Finally, there is a risk that the establishment of an infrastructure bank would create pressure to fund projects that would otherwise not pass a cost–benefit assessment, simply because there is capital available at any given time. Role creep has occurred in the context of a number of apparently specialist institutions (both domestic and international). The Commission has previously observed this outcome in the context of Australia's export credit arrangements. In that case, the agency in question utilised its growing capital base by progressively expanding its mandate to support a broader range of projects and supporting increasingly marginal ventures (PC 2012a). Similar issues would need to be addressed in the context of the proposed national infrastructure fund (discussed in chapter 7).

Notably, in its final report to the Australian Government, the Infrastructure Finance Working Group, on balance, did not support the establishment of an infrastructure bank or fund on the basis that it risked crowding out private financing institutions. This option was also discounted because the consultation process indicated there

[18] These included the Victorian Economic Development Corporation, the West Australian Development Corporation and the Australian Industry Development Corporation (PC 2012a).

was little support for the private sector to partner with government through an infrastructure fund (IFWG 2012).

On balance, the Commission does not support the establishment of an infrastructure bank.

Government infrastructure bonds

There are numerous types of bonds that could be considered to finance infrastructure projects, whether by government or the private sector, or whether issued under a general mechanism or tied to a specific project.

As discussed in chapter 5, specific purpose government bond finance has been phased out in Australia and borrowing is undertaken through centralised borrowing authorities that do not distinguish between borrowing purposes. The Australian Government had previously announced that it planned to issue Aussie Infrastructure Bonds — an instrument developed specifically to finance the National Broadband Network (NBN). In 2012-13, of the Government's $2.4 billion equity investment in the NBN, $2.0 billion was financed through Aussie Infrastructure Bonds (AOFM 2013). However, the bonds in their current form are sourced from the proceeds of general issuance of Commonwealth Government Securities, and effectively constitute a form of hypothecation of those proceeds, rather than specific purpose borrowing in their own right.

Broadly speaking, the rationale for raising finance through bonds is that it allows the borrower to access debt directly from individuals and institutions, rather than using commercial lenders as intermediaries (World Bank nd). Put another way, it may allow the borrower (such as government) to encourage additional private sector investment in infrastructure from a wider range of private investors, and provide competition to other sources of debt finance such as bank debt (Pottinger, sub. 8).

Commission's assessment

In principle, specific purpose securitised borrowing, such as infrastructure bonds, can have some advantages over general purpose borrowing. In particular, to the extent that the interest rate reflects the risks of the project, rather than the risks of default by the borrower (as is the case with general government debt issuance), the instrument would make the financing costs more transparent and could instil greater discipline on project selection.

However, if infrastructure bonds are used with the aim of bridging the financing gap otherwise not filled by the market, they would need to incorporate an incentive to investors to provide additional financing. To the extent that bonds are an alternative way of subsidising the project, the price of the bond (and, hence the interest rate) will no longer reflect the risk of the project, and the above advantage of project-specific bond finance disappears.

Where the government is the issuer, infrastructure bonds may have some perception value with investors that the debt is being raised for the overall benefit of the public. For example, the Waratah bonds issued by the NSW Government are being promoted to investors 'who want to secure a better future and invest in their state' (NSW Government nd). The marketing of government debt as being for the purpose of infrastructure investment may also make it more politically acceptable and assist in overcoming the consequences of public misconceptions about government debt discussed in section 6.1. However, the existence and extent of those gains are hard to assess.[19]

Ultimately, if government-issued infrastructure-specific bonds are to facilitate additional investment, they are likely to involve some form of subsidy. This is confirmed by past experience with such bonds in Australia (chapter 5) and is consistent with comments from some participants after the draft report (for example, Victorian Government, sub. DR196). The subsidy can take various forms including tax advantages (discussed below), or the underwriting by the government of the project's risks.

Tax concessions for infrastructure bonds

Some participants (Housing Industry Association, sub. 21; Committee for Melbourne, sub. 30; Urban Development Institute of Australia, sub. 40) discussed the possibility of an Australian Government scheme that provided tax concessions to infrastructure bond issues by private entities or State/Local Governments.

However, no submission has raised a convincing argument for subsidising infrastructure financing using this approach.

The only potential rationale would involve addressing any distortions in the taxation system. The Commission could not identify any distortions affecting infrastructure bond financing specifically (chapter 5). Some participants (for example, BCA, sub. 39), however, argued that there was a broader bias against infrastructure

[19] For example, in the case of Waratah bonds, a guarantee is provided by the NSW Government to encourage their uptake (NSW Government nd).

investment arising from the difference in the timing of investment losses and income from the asset, and the inability to carry forward those losses.

However, tax advantaged bonds are an indirect and opaque way of dealing with the issue. The approach would also be distortionary by virtue of favouring particular types of finance over others. Moreover, the problems may in part have been addressed by recent legislative changes, which allowed eligible entities to carry forward tax losses from the early years of an infrastructure project and to uplift these at the long term bond rate.[20] This means that even though such losses may be deferred for many years, they are now maintained at some measure of their present value. The changes have been supported by some participants (BCA, sub. 39).

Tax advantaged bonds are a feature of infrastructure financing in the United States, where it is the third largest debt market (Chan et al. 2009). However, the rationale for their introduction in the early 1900s was the doctrine of intergovernmental tax immunity — a feature of the US federal system of government — rather than any policy or economic considerations. Productivity Commission researchers have previously examined the US experience with tax-exempt infrastructure bonds and noted:

> The tax-exemption status has been a subject of court cases and congressional committee hearings. Furthermore, the extension of the tax advantage to the private sector has created conflict between federal and state governments … In practice it is an opaque subsidy that is not explicitly costed nor subject to the same political scrutiny that an intergovernmental grant would be subject [to]. (Chan et al. 2009, p. 81)

The Australian Government has at various times in the past developed schemes to provide tax concessions to assist private sector involvement in infrastructure financing. These have been subsequently withdrawn after significant issues were identified (box 6.3).

[20] The recent *Tax Laws Amendment (2013 Measures No. 2) Act 2013* (Cwlth) included changes to provide a tax incentive for entities that carry on a nationally significant infrastructure project designated by the Office of the Infrastructure Coordinator. It allows eligible entities to carry forward tax losses arising from the early years of the infrastructure project and to uplift them by the long term bond rate (to ensure their value is maintained). Those losses will also be exempt from the continuity of ownership test and the same business test to recognise that project owners change over time. This uplift is at the Commonwealth bond rate, and the program is subject to an expenditure cap of $25 billion up to 30 June 2017.

Box 6.3 Previous infrastructure bond tax concession schemes

Develop Australia Bonds scheme

The Develop Australia Bonds scheme was introduced in 1992. It involved the transfer of tax benefits from project proponents to project financiers. In return for giving up these benefits, project proponents received lower interest rates on borrowings from financiers of the project. The scheme was frozen in late 1996 and ended in 1997 due to its cost to the Budget and concerns that it was creating incentives for tax minimisation arrangements by some businesses.

In announcing the termination of the scheme following its examination, the then Treasurer stated:

> This examination has revealed that:
>
> - schemes being proposed are exploiting the concession for tax minimisation schemes; and
> - these additional taxation benefits are principally being accessed by financial packagers and high marginal tax rate investors.
>
> If the current applications were certified the revenue cost over 3 years could be over $4 billion. If tax aggressive schemes were adopted in all applications the cost would be substantially higher. The transfer of tax benefits as originally intended under the legislation is not working. (Treasury 1997)

Infrastructure Borrowings Tax Offset Scheme

The Develop Australia Bonds scheme was replaced in 1997 with the Infrastructure Borrowings Tax Offset scheme. This scheme allowed infrastructure proponents to apply to the Australian Taxation Office for a tax rebate, described as a tax offset within the *Income Tax Assessment Act 1997*, which is provided to the project's resident-infrastructure lenders. In return, the infrastructure proponent (the borrower) has lower finance costs, in the form of lower interest rates or other benefits, and forgoes tax deductions on interest payments associated with the loan. This was a selection scheme not an entitlement scheme. The selection of projects was based on the limited funds available, the eligibility requirements and the relative merits of the projects.

After several years of the scheme's operation, it was concluded that it failed to achieve its objectives for several reasons, including because it was an inefficient means of supporting the financing of infrastructure projects. The scheme was discontinued for new projects in 2004.

Sources: Allen Consulting Group (1999); IFWG (2012); The Treasury (1997, pers. comm., 31 January 2014).

In sum, the Commission does not support the introduction of tax advantaged infrastructure bonds.

Overall, the Commission has concluded that publicly issued project-specific bonds are unlikely to be a cost-effective way of bridging infrastructure financing gaps. In order to facilitate additional investment, the bonds require a public subsidy, which would erode any allocative efficiency advantages the instrument has over general recourse finance. Furthermore, depending on the form of the subsidy, but particularly in the case of tax incentives, there could be substantial issues in implementation.

That said, the Commission considers that *privately* issued bond finance can play a role in infrastructure investment, and the availability of this type of finance can be a source of competitive pressure on other types of finance. The Commission has considered this issue in section 6.4, in the context of possible impediments to bond finance created by the existing procurement process.

Converting infrastructure bonds

One participant has raised the possibility that governments issue 'converting infrastructure bonds' as a means of attracting new sources of private finance to public infrastructure projects (Pottinger, sub. 8, p. 3).

Under the proposed mechanism, a government would issue converting infrastructure bonds to financial investors such as superannuation funds or other investors seeking long-term stable inflation-linked returns. Pottinger (sub. 8) argued that the fixed income stream associated with converting bonds would make it more attractive to superannuation funds, which generally have a larger allocation to fixed income investments in their portfolios (15–25 per cent, compared to 5 per cent for equity investments).

During the construction phase, bond holders would receive a fixed coupon rate. Once construction and commissioning was complete, the bond would automatically convert to equity at a pre-determined price and project debt would be removed from the government's balance sheet. Converting infrastructure bondholders would then hold equity in the asset, and earn returns from the special purpose vehicle through the relevant funding mechanism (whether availability payments or user charges).

Commission's assessment

In its draft report, the Commission expressed some reservations about the design and operation of the instrument. In particular, the proposal appears aimed at increasing investment by long term investors by transferring project construction risks to the government. The absence of private financing as a discipline on

construction cost management undermines the original purpose of engaging private financing at this stage of the project. The instrument is also a fairly indirect method of delivering an incentive to private financiers and there may be complex implementation issues associated with determining the price at which the bond coverts to equity. This is likely to lead to high transaction costs.

In its draft report, the Commission asked for comment on the converting bond instrument. The limited feedback received, indicates doubt that the instrument would attract significant market interest (Victorian Government, sub. DR196; Lend Lease, sub. DR201). While bond holders may avoid construction risk, many submissions to this inquiry have indicated that superannuation funds (and other long-term investors) are also reluctant to be exposed to early demand risk with greenfields investments (Bianchi and Drew, sub. 33; ISA, sub. 60).

The National Australia Bank observed:

> … NAB is of the view that governments, industry participants and investors would be best served by the creation of more liquid, less complex and accessible products. In addition, the model for exposure and management of construction risk by the government would need to be properly understood to determine whether this is an effective model. NAB does not currently hold the view that converting bonds would form a significant part of the market in the short to medium term. (sub. DR124, p. 5)

The Commission considers that the benefits of developing mechanisms to support converting bonds are small relative to other reforms, and converting bonds should only be given active consideration by government where significant investor demand has been demonstrated and overall risk allocation is demonstrably improved from a public interest perspective.

Guarantees

Government guarantees can take a direct or indirect form, but in essence involve government accepting some or all risks of finance to leverage the raising of private sector capital, or bonds issued by different levels of government. Guarantees could be administered in various ways including via: direct contracts to cover the risks of a third party; a dedicated non-recourse infrastructure fund (modelled on the UK Guarantee Scheme); or a government sponsored credit reinsurance provider.

Various potential benefits have been claimed by participants, including that guarantees could help:

- enable private financing to be raised where otherwise it would not be accessible for major projects (Pottinger, sub. 8)

- address the current structural gap in the market for debt reinsurance/credit enhancement since the exit of monoline insurers (Pottinger, sub. 8; Herbert Smith Freehills, sub. 68)
- lower total financing costs where a private financing solution is sought for a public infrastructure project (Herbert Smith Freehills, sub. 68), including by attracting new sources of financing in competition to bank debt
- address gaps in debt insurance markets where the government views project risks as lower than estimated by the market (DIRD, sub. 64)
- assist the development of a project bond market (Westpac, sub. 51)
- achieve the benefits without adversely affecting the government's net debt (aside from the initial seed capital) or credit rating, where it was administered on a commercial and independent basis by a separately established statutory entity which did not enjoy any government support (Herbert Smith Freehills, sub. 68).

Commission's assessment

The Commission considers that the use of guarantees entails several risks and costs for the government and taxpayers.

First, guarantees require government to take on substantial contingent liabilities (Brealey and Myers 1986). Unless a guarantee scheme was appropriately structured to leave some of the risks with the borrower, it could introduce moral hazard risks where the underlying borrower has an incentive to take on more risks than optimal. For example, a guarantee could encourage the recipient to maximise the amount of gearing used for an infrastructure project rather than 'unlock' private finance that would otherwise be available.

Second, while guarantees are contingent liabilities that would not have a direct cash impact on the budget (unless they are called on); systematic use of them may nonetheless put pressure on government credit ratings (DIRD, sub. 64). Indeed, the fact that there is no explicit link between the guarantee and its budget impact, undermines the transparency of the arrangement and limits the external discipline on the issuer to appropriately price and manage risks. Guarantees are not costless and are in reality government debt with a probability distribution.

Third, while many participants have noted the reduced activity in the commercial credit reinsurance market, there may be indications that the commercial monoline market is beginning to re-emerge in some instances (HSF, sub. 68; Assured Guaranty, sub. 29, sub. DR128). The Commission is also aware that a number of infrastructure companies which previously relied heavily on monoline insurers have

successfully undertaken substantial refinancing without insurance since the GFC. Hence, it is not clear whether the current absence of commercial credit enhancement facilities for greenfields infrastructure projects can be considered a 'market failure' within infrastructure financing markets, or whether the markets have evolved in such a way that demand for this service has contracted.

Thus, while the use of government guarantees may encourage greater availability of private financing from a wider range of sources, they create many other (often less transparent) costs and risks for the public sector which need to be identified and properly assessed. Governments can and do lose from providing loans and guarantees to opportunities which the private sector had rejected, particularly when appropriate governance arrangements are not in place (box 6.4). Furthermore, to the extent that a guarantee is only offered to some private sector financiers — for example if it were offered exclusively to onshore lenders — it would distort outcomes in financial markets.

In sum, accounting rules notwithstanding, there should be no difference in practice between direct debt issuance and guarantees, save for their respective transaction costs (which are likely to be greater for guarantees), and the possibility that the market may misconstrue the commitment to be larger than the government intends. Should the market incorrectly treat a limited guarantee as a comprehensive one, by the time the guarantee is called it may not be a simple choice for the government to walk away, even where it is the optimal decision. Finally, suggesting that a guarantee avoids a fiscal balance sheet impact is effectively an argument for *non-transparency* — a public policy position that is difficult to justify and is entirely at odds with the direction proposed in this report.

Box 6.4 **London Underground PPP**

In December 2002, Transport for London (TfL), the parent body of London Underground Limited (LUL), entered into contracts with Metronet BCV, Metronet SSL (Metronet) and Tube Lines for the maintenance and refurbishment of parts of the London rail infrastructure. As part of this arrangement, LUL guaranteed 95 per cent of Metronet's approved debt in relation to the works to lower the cost of borrowing. Additionally, the UK Department for Transport gave informal assurances to Metronet's lenders that the Secretary of State would intervene in the event that LUL was unable to meet its financial obligations.

(Continued next page)

Box 6.4 (continued)

In July 2007, Metronet went into administration due to poor corporate governance and leadership, requiring LUL to buy out 95 per cent of its outstanding debt obligations. The Department for Transport provided a grant of £1.7 billion to help fund the purchase, causing an estimated loss to taxpayers of between £170 million and £410 million in 2007 prices.

In its 2009 report, the UK National Audit Office concluded that this loss was incurred partly as a result of the Department for Transport's risk management arrangements. Because the Department for Transport acted as an informal guarantor, it was not party to any of the procurement contracts. As such, it was unable to adopt an appropriate risk management strategy, because it had no direct influence over Metronet's performance and relied on other parties (including TfL and LUL) to identify and mitigate risks.

Sources: UK National Audit Office (2004, 2009b).

Liquidity guarantee — extending RBA repo eligibility

Currently, the Reserve Bank of Australia (RBA) enters into repurchase agreements ('repos') with private securities issued by APRA-regulated Authorised Deposit-taking Institutions (ADIs) in order to manage domestic liquidity and interest rate markets. Under the agreement, one party sells a security to the other, with a commitment to buy back the security at a later date for a specified price.[21]

If the term is greater than one year, the security must have a credit rating of BBB+ at minimum. The other types of corporate asset-backed securities currently eligible for an RBA repo are required to be rated AAA/A1 — the highest credit quality. This means that infrastructure bonds (typically rated in the BBB ratings band in the corporate market) are not eligible. The RBA has discretion to change its eligibility criteria for its repo activities at any time.

One participant (Assured Guaranty, sub 29) has proposed that the RBA should extend its current repo activities to support debt instruments issued for eligible PPP projects:

> The market for infrastructure bonds would be significantly enhanced if securities issued to fund PPPs in Australia, carrying a financial guarantee from a well-rated institution,

[21] The difference between the sale and repurchase price reflects the rate of interest to be earned by the cash provider. While repos are similar to secured loans in an economic sense, a fundamental distinction is that title to the security passes to the cash provider for the duration of the repo. The RBA's operations in the repo market are designed to promote the smooth functioning of debt markets (Wakeling and Wilson 2010).

were to be included as repo eligible securities. It would make infrastructure bonds a more attractive investment for many market participants, including longer term issues.

One avenue for this enhanced attractiveness would be improved market liquidity. Many superannuation funds are reluctant to invest heavily in longer dated infrastructure debt because of a perceived lack of liquidity and the belief that Member Choice means that funds need to be highly liquid. (sub. 29, p. 7)

Under the proposed mechanism, a debt security issued to finance a PPP in Australia, carrying a financial guarantee from a well-rated institution, would be eligible to enter into a repo with the RBA if it had a specified credit rating from a 'well-rated institution'. In effect, this would act as a credit enhancement facility (or an implicit guarantee) provided through the RBA's repo activities.

Commission's assessment

The effect of the proposal would be to transfer liquidity risk from the private sector financier to the RBA. While the RBA performs this role for some securities (reflecting its capacity to assess and manage liquidity risk), extending the RBA repo facility to infrastructure bonds issued to finance PPPs would represent a fundamental shift from its current activities.

RBA repos are essentially a macroeconomic policy tool, primarily used to ensure the smooth functioning of financial markets and to align the supply of exchange settlement funds and the cash rate with RBA's monetary policy targets (Wakeling and Wilson 2010). Assured Guarantee's proposal would introduce a new function for the instrument. Assured Guarantee also confirmed that it was not aware of such use of a liquidity facility from a central bank in the markets in which it was operating (trans., p. 27).

There would also be implementation issues. The RBA currently only deals with securities rated lower than AAA if they are issued by APRA-regulated ADIs. Under the proposed mechanism, the RBA would be exposed to the risk of a counter-party that is currently not subject to the same level of regulatory oversight. Consequently, it would likely be required to undertake significant due diligence (adding to transaction costs) or have the counter-party subject to prudential regulation by APRA, and would price any uncertainty into its expected risk-adjusted return for the repurchase price.

On balance, the Commission does not support this proposal.

Availability payments

The use of availability payments to fund infrastructure PPPs involves the government making payments to a private provider which are not linked to service utilisation or patronage levels, but some other 'service based' metrics determined by government. In effect, they are a mechanism for the government to still pursue private financing of a new infrastructure project while retaining patronage/demand risk.[22]

Availability payments are widely used in Australia and overseas (for example, in Canada), particularly in funding social infrastructure (IFWG 2012; Poole 2011). More recently, the availability payment PPP model has been adopted or proposed for road projects in Victoria — for example, the Peninsula Link and the East West Link projects (Victorian Government, sub. 81).

Participants provided a large volume of comment generally supporting the use of availability payments as a mechanism for encouraging greater private investment in greenfields projects (for example, Lend Lease, sub. 46; McLeod Rail, sub. 49; Westpac, sub. 51.) One of the main stated rationales for considering the more widespread use of availability payments for economic infrastructure projects (such as a toll road PPP) is that there is at present limited market interest from the private sector in assuming patronage risk, particularly for greenfields projects. This has been influenced by the recent commercial failure of toll road PPPs in Australia (AMP Capital, sub. 86; BCA, sub. 39; Pottinger, sub. 8; Victorian Government, sub. 81; Westpac, sub. 51).

Commission's assessment

Availability payments are essentially a funding mechanism which transfers demand risk from the financier to the government, and which can be used to subsidise additional private sector finance. Whether they are efficient depends entirely on the context. In certain circumstances, there may be merit in governments exploring the use of availability payments for the delivery of economic infrastructure.

In general, past failures in various investment projects have rarely discouraged private investment in the long-term and as such should not be uncritically used as justification for greater use of availability payments. Investors vary in their appetite for risk. Provided projects are appropriately selected and well-structured, and the

[22] While availability payments are a source of funding not financing they are relevant in the current context because they have been raised as a means of encouraging private financing of infrastructure projects.

investment is commercially viable, supply of finance should follow. It is notable that the cited failures, such as the Cross City Tunnel PPP and the CLEM7 Tunnel PPP, have as their catalyst an overly optimistic assessment by private consultants of likely patronage. The most important contribution from government in this area is to ensure that its provision of information is accurate and sufficient, and to promote a tendering and bidding strategy that is most likely to gain sustainable and sensible tenders.

That said, the approach may represent a more efficient allocation of project risks where the government is better placed than the operator/investor to manage the demand risk it is assuming. This could arise, for example, due to the network nature of economic infrastructure such as road networks. However, it should not be assumed that governments are better placed to manage network risks. For example, Transurban (sub. 60) has taken on such risks in the case of several toll road projects.

Other scenarios where an availability payment model could be appropriate include infrastructure where utilisation is subject to large sovereign risk, or where the major benefit to the public from the infrastructure comes from the existence of the asset and/or security of supply, rather than actual regular use.[23]

Finally, where user charging is not feasible or is not sufficient to fully fund the project, availability payments would offer a way of delivering the required revenue stream. In this context, the Commission agrees with Transurban (sub. 60) that the staggered nature of the payment would constitute a better risk sharing arrangement than a lump sum subsidy paid up front.

On the other hand, if they are not administered appropriately or are used in the wrong context, availability payments would simply shift the risks and costs onto taxpayers with little or no improvement in risk management. In this context, it is worth keeping in mind the tradeoffs from private sector involvement in infrastructure financing — namely, better risk management at a higher cost of transacting. To the extent that availability payments shift much of the risk to the government, the scope for efficiency gains from private sector participation is eroded (becoming largely confined to optimising construction and operating costs). Depending on the size of the transaction costs from involving the private sector, the balance may shift to full public sector provision.

Importantly, availability payments should not be used in a way that undermines any incentives to engage in efficient user charging, where the project has capacity for user charging. The Commission agrees with the Infrastructure Finance Working

[23] Water desalination plants are one example of this scenario.

Group (2012) that, where possible, availability payments should be tied to the application of user charging. The balance between the two funding sources should reflect the relative capacities of the parties to assess and manage risk.

Ultimately, the merits of using availability payments will depend on several factors including: whether a proper project-level assessment has been undertaken to establish that government is better placed to manage the risks it is assuming; consideration of whether it will dampen incentives for government to explore user pays funding models; and ensuring that government gets a commensurate reduction in the private sector cost of finance where it reclaims any project risk.

6.4 Superannuation fund liquidity issues

One of the barriers to superannuation fund investment raised by participants (Industry Super Australia, sub. 60; Cbus, sub. 67) relates to the liquidity obligations of Australian funds, which have been argued to constrain the ability of those funds to invest in relatively illiquid asset classes such as infrastructure.

The liquidity obligations of superannuation funds are a product of both the key characteristics of the Australian superannuation system and the prudential regime that regulates it. Specifically, participants have argued that the following features of Australia's superannuation system constrain investment in infrastructure:

- *lump sum withdrawals* — most superannuation can be taken as a lump sum at retirement, creating a 'cliff' at the end of the accumulation phase. In a relatively open-ended defined contribution system, such as Australia's, this could be a source of pressure on liquidity
- *portability, or 'choice of fund' rules* — these allow members to switch funds on 30 days' notice, meaning funds must maintain sufficient liquidity to finance short-term redemptions. However, there is an exception to the portability rule for investments in illiquid assets in choice products, provided written consent is obtained from members.

There are also several prudential requirements that influence the liquidity profile of asset portfolios (box 6.5).

Box 6.5 **Liquidity restrictions on Australian superannuation funds**

APRA introduced a number of superannuation prudential standards in July 2013 as part of the Stronger Super reforms. The following are relevant to liquidity standards.

- *Operational Risk Financial Management (Prudential Standard SPS 114)*, which requires superannuation funds to maintain a target amount of financial resources to address the operational risks of their business operations.
- *Investment Governance (SPS 530)*, which requires superannuation funds to:
  - determine appropriate measures to monitor the performance of investments on an ongoing basis, including a stress-testing program
  - formulate a liquidity management plan that: covers each investment option; outlines the procedures for measuring and managing liquidity on an ongoing basis; consider how the liquidity of investment options can be managed in a range of stress scenarios; and outline what action the superannuation fund will take when a liquidity event occurs.
- *Risk management (Prudential Standard SPS 220)*, which sets out requirements for a risk management framework, including for superannuation funds to maintain adequate technical, human and financial resources at a level that is adequate for their business operations.

Participants have proposed a number of ways of relaxing these liquidity requirements, including:

- a government liquidity guarantee for superannuation funds regulated by APRA similar to the deposit guarantee scheme provided to ADIs following the global financial crisis (Industry Super Australia, sub. 60; Cbus, sub. 67)
- a temporary lifting of the prudential requirements governing superannuation funds to overcome the 'lumpiness problem' with investment in large infrastructure projects (Cbus, trans., p. 45)
- a government-backed liquidity pool mechanism that allows individual contributing funds access to liquidity should certain levels of risk be attained (Industry Super Australia, sub. 60; Cbus, sub. 67).
- an 'Infrastructure Debt Authority' with seed funding (Maritime Super, sub. 15)
  - This entity would have a mandate to source debt capital for a fixed long term period from super funds for investment into selected infrastructure projects. In return, it would provide super funds with a rate of return guaranteed by the government (suggested as CPI + 2.5 per cent) with the status of senior debt.
  - This model shares similarities with an 'investment bank' model that is already used in other countries. It is intended to be narrower in scope because

it is focused on sourcing debt capital from superannuation funds, and all other matters such as project selection would remain with government.

That said, some participants (for example, the Financial Services Council, sub. 22) have argued against changes to superannuation arrangements in the interest of stability in the superannuation system.

Commission's assessment

The primary objective of superannuation funds is to provide benefits to members on their retirement. As such:

> Some have proposed superannuation as a potential pool of funding for infrastructure investment. In the Reserve Bank's view, it would not be appropriate to mandate superannuation funds to invest in particular assets to meet broader national objectives. Rather, investments must be managed in the best interest of the membership. It cannot be forgotten that the objective of the superannuation system is to provide income in retirement. (RBA submission to the Financial System Inquiry, p. 7)

Australian superannuation funds already have relatively high average asset allocation to unlisted infrastructure relative to other developed country pension funds, and can invest in infrastructure assets through a range of channels — particularly in mature brownfield assets — either directly, or through pooled open-ended unlisted infrastructure funds and various index funds.

More generally, infrastructure funds have an incentive to optimise their portfolio between different asset classes, with liquidity being one of the considerations. Interventions that blunt those incentives would be sub-optimal.

There may also be some countervailing factors which would mitigate the impact of the liquidity restrictions facing superannuation funds naturally over time, as it relates specifically to their appetite for investments in infrastructure. This includes a continuing trend toward consolidation within the superannuation industry (particularly the industry sector) (PC 2012b).

Current arrangements have been reviewed recently

The prudential standards for superannuation funds (including the liquidity requirements) were introduced as part of the Stronger Super package of reforms. As previously documented by the Commission (2012b), the Stronger Super reforms were introduced following a comprehensive review (The Cooper Review), which was completed on 30 June 2010.

Further, APRA's regulation impact statement for these prudential standards (APRA nd) states that these standards, including the liquidity requirements were developed:

> … in consultation with the regulated industries and other stakeholders to facilitate the consideration of the costs and benefits to all parties affected by the requirements. APRA's proposed prudential standards for [superannuation funds] not only implement key elements of the Government's Stronger Super reforms, but also support APRA's mission to ensure that [superannuation funds] act in a manner that is consistent with the best interests of superannuation beneficiaries. (APRA nd)

The standards have been in effect for less than a year, so there is little available evidence on their efficiency to date.

In terms of the other concerns raised by participants about lump sum withdrawals and choice of fund requirements, these have been recently examined by the Cooper Review (2010). The Commission also notes that, while there are no accurate data available on how many members switch funds, it appears that relatively few do so. For example, a Roy Morgan Research (2014) survey showed that in 2013, on average, only 5.1 per cent of members indicated that they were very likely to switch funds within the next 12 months.[24]

In discussing the issue of the impact of liquidity considerations on infrastructure investment, Mercer Consulting observed:

> From our experience, coupled with anecdotal reports from Australian superannuation funds, the constraint to investing in infrastructure is not a product of illiquidity considerations by Australian superannuation funds but rather the availability of 'bankable' projects. (2011, p. 65)

More broadly, infrastructure is not unique in its liquidity characteristics. Other asset classes, such as real property are also relatively illiquid, but form a substantial part of portfolios of larger funds — for example unlisted property accounts for, on average, 11.6 per cent of industry superannuation funds' asset allocation (ISA, sub. 60).

While the broader regulatory framework may alter the way in which superannuation funds engage in investment decisions, including in illiquid assets such as infrastructure, this is a result of a decision about the way the broader financial system will be regulated, and is not an issue specific to infrastructure. Therefore, it is not an issue that could be resolved by this inquiry. That said, the Commission sees merit in further assessment of the claim by participants that the existing APRA requirements imposed on superannuation funds could impede efficient investment

[24] The figure was 4.8 per cent for industry funds, and 6.7 per cent for retail funds.

activity into illiquid assets, such as infrastructure. Specifically, the Commission notes the proposal by Cbus to allow the superannuation funds to seek temporary regulatory relief to address lumpy investment issues:

> This would have to be supervised by APRA under the sole-purpose test, that is, that the infrastructure that we wish to invest in which tips over a bit on illiquidity provided a greater return than any other investment such that it was a good proposition for the members of the fund … . It would be an APRA-governed criteria … we could see an advantage, for example, in our members getting a return over 25 years at 10 or 11 per cent from a piece of infrastructure compared to … the market which is returning about 5 or 6 per cent. So we're prepared to pay for the difference, which might be a liquidity guarantee difference, to service that. (trans., pp. 44–5)

Infrastructure Debt Authority

An Infrastructure Debt Authority is likely to distort the investment decisions of superannuation funds. It creates an incentive for funds to invest in one asset class over another, and also creates an incentive for superannuation funds to invest in debt rather than equity. The ultimate objective of superannuation funds should be to provide appropriate risk-weighted returns to members, and investment in infrastructure debt may not always be suitable. Further, guaranteeing a rate of return (suggested as CPI + 2.5 per cent) can dampen the incentives private sector financiers have to appropriately assess and manage risk, and can create moral hazard.

The proposal would also carry the weaknesses of a Government-owned infrastructure bank detailed earlier.

Ultimately, the Commission agrees that the liquidity constraints affecting superannuation funds may warrant consideration by policy makers. The Commission understands that the Financial System Inquiry is considering broader matters of financial regulation, including regulation of superannuation funds. It is more appropriate for these matters to be considered as part of a broader review.

6.5 Distorted incentives in the procurement process

As noted in section 6.1, the nature of the current procurement process is seen by a number of participants as a significant barrier to the involvement of some categories of financiers in greenfields projects. Specifically, a substantial volume of comment identified the current approach to tendering as favouring bank finance by placing a relatively higher transaction cost on participation for equity and bond financiers (box 6.6).

Box 6.6 **Participants' comments on finance procurement**

At least eight major infrastructure investors in Australia typically do not participate in greenfields PPP projects either as a bid sponsor or primary equity investor. Very high bid costs and long procurement processes with 'patchy' deal flow limit the number of parties who can afford to dedicate large teams for such projects. Long-term equity investors like superannuation funds do not see the relative value to divert resources away from pursuing brownfield infrastructure to greenfields PPP projects that involve such a costly, lengthy and uncertain process ... In the absence of long term equity investors as bid sponsors who operate under more conservative assumptions, short term focused project sponsors are motivated to put forward aggressive financing assumptions to lower the cost of capital ... Such finance packages may provide an upfront lower cost but they also have a latent cost because they may not be capable of refinancing. (ISA, sub. DR114, pp. 3, 5)

The high upfront costs emerging from the current 'single bid model' create a 'barrier to entry' for many investors, including Cbus, from seeking to participate in public infrastructure funding. (Cbus, sub. 67, p. 5)

One of ASFA's criticisms of PPP processes is that superannuation funds face a challenge in putting up speculative capital to finance the bidding costs of a PPP. One of the implications of this is that PPPs have in the past been dominated by commercial providers with short term incentives. (ASFA, sub. DR139)

… the requirement for highly committed bids is costly and restricts access to the market potentially making it less competitive. There are a very limited number of non-banks willing to participate in the bidding process and differing appetite for bid phase involvement by banks. The problems associated with this are more evident in a soft market. (OIC, sub. 78, attach. M, p. 13)

In Australia, parties that bid to participate in PPPs are required to include fully underwritten, price-certain debt terms at bid date. This approach does not support capital market execution, which typically cannot lock in pre-commitments from investors, and thus strongly gravitates financing towards banks who are in a position to provide such commitments. (Assured Guaranty, sub. DR128, p. 4)

As the current market requires bids to be submitted with committed financing without price flexibility, it is difficult to develop a market for underwriters to provide firm bond pricing at the time of bid lodgement, which will carry to the time of bond issue at financial close. (NAB, sub. DR124, p. 3)

Participants have proposed two alternative procurement approaches to address the issue:

- a bidding process that unbundles financing from the initial project tender
- an 'Inverted bid' model.

The Commission has assessed those proposals below.

Unbundling the financing from the procurement process

To the extent that the current procurement process distorts the structure of the finance for infrastructure projects, the appropriate policy response is to target those distortions directly and to seek a process that levels the playing field for different types of finance.

Several participants argued that the key source of distortion was the requirement to submit fully financed bids, which biased the financing structure to bank finance. Assured Guaranty (sub. DR128) proposed that the issue could be resolved by modifying the current procurement process to remove the requirement for bidders to provide fully committed financing at the outset. Under the arrangement, funding would be arranged by the successful bidder after winning the tender, with financial close occurring thereafter. Assured Guaranty observed that a similar approach is currently in place in the United Kingdom to encourage complementary sources of finance and stated:

> Assured Guaranty has successfully closed four project finance transactions on this basis since mid-2013. These Greenfields deals were successfully financed in the long term bond markets with the benefit of our financial guarantee on terms considered by project sponsors to be more attractive than the bank debt alternative. (sub. DR128, p. 5)

The model referred to by Assured Guaranty is the UK PFI model and the recent PF2 reforms. While that model has some features that are not relevant or necessarily efficient in the Australian context,[25] the Commission considers that the concept of unbundling the financing at the initial tender stage could have merit.

Potential benefits of unbundling financing from the bidding process

The key potential source of gains would be from the opening of the financing stage of the project to greater competition from a potentially broader range of project sponsors.

Under the current approach, each consortium bidding on the project has a financier (often a bank or lending syndicate) locked in as the sponsor.

With the financing unbundled from the initial bidding for the project, the preferred bidder can seek finance (equity and debt) from the entire range of providers. There may be potential for wider engagement of alternative sources of finance for which the current arrangements may act as a barrier, such as long term project bonds or

[25] The model has several common features with the inverted bid model, including mandating the use of non-bank finance, which exposes it to the same issues as the inverted bid process, discussed below (Hellowell 2013).

equity. There may also be scope for increased competition between bank financiers because the financing task would now be subject to explicit competition rather than only implicit and diluted competitive pressures as part of a bundle of services in a consortium. And, to the extent that 'excessive' bank fees are a consequence of the current arrangements, competitive pressures could drive down those margins.

The above gains are not guaranteed to eventuate. Furthermore, there may be countervailing effects if the unbundling compromises the risk allocation and management currently performed by the financiers within the SPV. That function would need to be picked by the winning bidder. However, the proposed approach is the most direct way of testing whether the current procurement process limits the competition from different finance sources, and of assessing the scope for gains from competition.

Importantly, the financing process would remain neutral between the sources and types of finance, leaving these decisions with the preferred bidder, who has the incentive to adopt the optimal financing structure.

Implementation issues

The key issue with unbundling the financing from the initial bidding is the risk that the winning bidder will subsequently fail to secure finance (or secure it on the terms that are inferior to those they initially budgeted for). This may create pressure for renegotiation of the terms with the winning bidder or necessitate negotiation with the best losing bidder.

To some extent, bidders have an incentive to minimise those risks and abstain from opportunist bidding themselves. The cost of tendering and subsequently failing to secure financial close provides an incentive to conduct due diligence on the availability and cost of finance prior to submitting a bid. In this context, it may be optimal for the government to provide a clear and credible signal that it will not renegotiate terms with a winning bidder that fails to secure finance.

The risk of moral hazard, as well as the costs to the government can be further reduced by requiring bidders to submit refundable bond payments, with the winning bidder surrendering their bond if they failed to secure financial close. The size of the bond could be set to match the cost to the government of negotiating with the next best bidder, combined with the net economic cost of project delay. Governments could also play a role in reducing the risks, by conducting their own due diligence on the tenderers to assess whether they would be likely to have the capacity to secure the finance for the size of the project under consideration. Indeed, some governments now do market soundings during the tender process, so the size

of the cost to government may be small. Furthermore, the cost-benefit study of the project, if undertaken prior to the tender as recommended by the Commission, should reduce the risk of the project being 'unbankable'.

There may also be scope to mitigate the consequences of the bidder failing to secure finance on anticipated terms. Where the costs of extending the bidding process are substantial, the government could allow some price flexibility within bids. This appears to be the approach adopted by Canadian procuring agencies (OIC, sub. 78, attach. M; Clayton Utz 2013).

Nevertheless, the Commission acknowledges that the risk cannot be eliminated altogether. Ultimately, the certainty about the price needs to be traded off against potential lower procurement costs and greater competition from finance providers. The Commission considers that the optimal balance is unlikely to involve the complete elimination of risk on the price of finance for the procurer, which appears to be the objective under current processes.

The Commission sees merit in conducting a pilot procurement program in which the requirement to provide fully financed bids is removed, and the task of arranging and structuring financing rests with the winning bidder, after the tender has concluded, but before financial close.

RECOMMENDATION 6.1

Governments should undertake pilot procurement programs without the requirement for bids to be fully financed at the time of tendering for the project.

Inverted bid model

Industry Super Australia made a submission to the draft report (sub. 60) proposing an inverted bid model to facilitate greater investment in Australian infrastructure by equity providers (box 6.7). The Commission has discussed the proposal with ISA on several occasions, including at the public hearing for this inqury. (ISA has also been discussing the proposal with other parties, independently of the inquiry.) The Commission provided a preliminary assessment in which it expressed some reservations with the design of the model as it was originally proposed and called for participant comment on the proposal. ISA has subsequently provided a submission in which it included more detail on its proposal and sought to address the issues raised by the Commission and others. The Commission understands that the proposal has not been finalised yet.

Box 6.7 **Description of the inverted bid process**

Initial tender for long-term equity and internal rate of return agreed

A SPV manager (either long-term equity, or a fund manager acting on their behalf) will be appointed and a concept business case prepared. A tender for the long-term equity partner is then conducted. Participation in the tender process is conditional on the tenderer providing a threshold level of equity requirement from their balance sheet (a figure of 25 per cent was proposed), and not selling the equity for a meaningful period after project completion.

Once the tender process is finalised, the government and the successful long-term equity partner will enter into a contract for an agreed internal rate of return (IRR). This IRR is determined on the initial cost estimate sourced from the concept business case, although it could be developed as part of an iterative process as more detailed designs are developed.

The IRR could be fixed, or incorporate a risk-sharing arrangement negotiated with the government. To be implemented, the IRR would have to be converted into an *ex ante* guaranteed revenue equivalent.

Second round tenders conducted

Long-term equity then conducts separate tenders for design, construction, operations and maintenance and a full business case will then be developed. To prevent the cost changing between the time the government and long-term equity agree on compensation, and when the other consortium partners are involved in the project, a 'design to cost' approach would be adopted. If debt finance had not been secured earlier on, a tender for debt finance will also be conducted.

The SPV manager's profits will be based on the performance of the project over its lifetime. They will only be able to charge a fixed, performance-based fee for their services.

Probity and selecting the most robust owner-operators

A key feature of the model is that the SPV manager appointment and the selection of the equity owner-operator occur at the start of the procurement process, before the engagement of other participants including designers and contractors. What follows is an iterative process of engaging the other key parties and clarifying project specifics.

ISA proposed that the equity owner-operator would be selected through a competitive process. However, the competitive selection process could only generate meaningful outcomes if the participants are assessed against appropriate criteria *and* if there is sufficient information to support the assessment.

There is a risk that if it is undertaken before the project is sufficiently specified, the equity funding competition will revert to a simple cost of capital contest. This would undermine any claimed risk management advantages of engaging equity in the first place.[26] Alternatively (or in addition), this arrangement may create a governance problem. Where there is insufficient objective and robust information to support an assessment of the proponents, the risk of tender participants gaming the system to win the tender are magnified.

ISA has proposed that governments could work with the SPV manager to develop the project goals, brief and business case, before the equity competition. However, while this may provide some information, it will still be at the formative stage of the project and would not provide adequate information to ensure that the most robust proponent is selected.

IFM Investors (sub. DR214) has subsequently proposed that the engineering and detailed design could be finalised by the government before the equity competition. The Commission supports governments playing an active role in informing tender participants (discussed later). However, the Commission is not convinced that governments could fully substitute for the due diligence currently performed by consortia. Indeed, if the role were left fully with the government this would limit the scope for long-term equity to add value through its own participation.

Risk allocation

ISA has proposed that the equity investors would be bidding on a SPV's internal rate of return (IRR) which would be converted into a revenue equivalent before the commencement of the project. While this provides certainty of a kind, it is hard to envisage a meaningful arrangement on the allocation of risks between the government and the equity partner to justify that revenue-equivalent. Substantial future adjustments may be necessary as new information emerges.

The inverted bid model has some similarities with the unsolicited bid model adopted by several State Governments (appendix J). In that context, the NorthConnex project, is one example where the equity owner-operator (Transurban) developed a business case and successfully negotiated project terms with the NSW Government early in the project's life (Wiggins 2013). Nevertheless, that project involved a linking of two existing roads and thus, would be more akin to a brownfield rather than a greenfields project.

[26] The correct metric for comparison is the risk adjusted rate of return. There are various ways of measuring this, including, for example, the Sharpe ratio. However, all of them require some information on risk.

Procurement and the effect of unbundling the consortium

The inverted bid model unbundles the current consortium structure and, having selected an equity provider, replaces it with a sequence of tenders for the various roles within the project. This may give long-term equity enhanced buying power, and lead to some contracts being more competitively priced. However, it is unclear whether those gains represent an actual efficiency improvement or a simple redistribution of margins between the investor and the contractor. Furthermore, any potential gains need to be weighed against the apparent benefits of consortiums, such as risk-sharing (chapter 3).

This is not an argument against *any* unbundling of the consortium structure. As discussed earlier, it may be efficient to unbundle some parts of the vehicle, such as finance. However, a more prudent approach would involve experimentation with *some* unbundling, before a more substantial departure from the traditional model is considered.

Fee leakage

ISA argued that the appointment of an equity investor as project sponsor would resolve the issue of 'fee leakage':

> We note that the only fee payable under the IB Model is the set fee paid to the SPV Manager subject to achieving key performance indicators. In particular, we are referring to advisory and transaction fees withdrawn by the project sponsor, which can extend to tens of millions. (sub. DR150, p. 18)

The concern of some significant equity providers about high fees should not be discounted. However, viewed in isolation, transaction and advisory fees are only one contributing factor to the overall cost of financing, and not the largest. Furthermore, fee-free transactions are neither likely nor efficient — the real issue is what value is obtained for the fee. Arranging finance and managing risks for large scale high risk investments in fields other than infrastructure similarly involves high fees. As discussed earlier, SPVs involve complex contractual arrangements that allocate risks within and outside of the vehicle and coordinate a large number of disparate parties. Furthermore, as the project risks are highest early in its life, it is not unreasonable that the benefits of risk management would be greatest at that stage too. Thus, the fee charged by the bank financier for their early involvement in the project may be a reflection of the value they bring to the SPV.

While some submitters to this inquiry representing equity investors suggested that high transaction fees for greenfields projects may lead them to prefer brownfield

investments, larger issues — demand risk and liquidity, covered earlier — are also involved in equity participants' reservations about greenfields projects.

Competition effects

ISA argued that the inverted bid model is pro-competitive, because the process involves several competitions at various stages of the project, including the initial funding competition for the equity sponsor, tenders for construction and management, and for debt finance.

The Commission agrees that reforms that improve the scope for competition are welcome. The proposed model mandates that this role will be managed by long-term equity investors. The intention would be for equity to determine the role and quantum of debt finance rather than the other way around.

ISA (sub. DR150) proposed a threshold level of long-term equity involvement as a condition of participating in the initial funding competition. This would mean setting limits on the participation of bank and other forms of debt, as well as any short-term equity. This seems an indirect way of targeting any distortions in the procurement process. Moreover, it could limit the capability of the market to offer better options, if too inflexible a capital structure is mandated at the outset, due to the chosen level of long-term equity.

Throughout the inquiry ISA, Cbus and IFM Investors argued compellingly that long term equity investors have an incentive to maximise the value of the asset over its lifetime and hence should have control of the project from its inception. However, other participants also strongly contended that debt finance has traditionally played an important risk management role in greenfields investments, and that banks have the skills and capacity to perform the function.

Ultimately, assuming the investment risks are appropriately allocated between the government and the private sector participants (including those within and related to the SPV), the question of which capital structure and which type of financier delivers the greatest economic value, is one that can only be answered by the market.

In sum, to the extent the inverted bid model allows flexibility, the price struck for equity participation at the outset may need to be renegotiated, and thus raise probity concerns about the original selection. To the extent it does not allow flexibility, it may undermine its greatest potential advantage — improving risk management from a shift of the balance between long-term equity and providers of short-term debt.

That said, the Commission considers that there may be merit in exploring a model that incorporates some elements of the inverted bid model into the existing procurement process. The key features of the potential 'hybrid' approach are outlined below.

Features of the hybrid model

Ensuring an informed and robust bidding process

It is essential that the tender for the private sector partner does not occur before a substantial effort is undertaken by all the relevant parties to identify and allocate project risks.

Two aspects of the process would facilitate this. First, it is important to involve all the relevant parties in the identification and allocation of risk. To this end, the current consortium approach to bidding should be retained to the greatest possible extent.

Second, the government partner can also contribute significantly. This report recommends that infrastructure projects should be generally subject to a robust, comprehensive and transparent cost-benefit analysis. This analysis would form a key part of the due diligence required to inform project selection, but also the decisions of private sector participants. Publishing this analysis, as well as the data and assumptions underpinning it, and any other relevant material, *prior* to the tender would deliver a dual benefit:

- it would reduce bidding costs (as well as eliminate inefficient duplication of due diligence), which could open the field to a broader range of participants
- participants would provide more informed bids, which would facilitate the selection of the best proponent.

Demand side of procurement — setting the appropriate bid metric

As noted, some participants observed that current procurement outcomes are biased in favour of projects with the lowest short term cost of finance. One possible reason is that the bid assessment criteria are poorly aligned with the economic benefit of the project over its life. For example, if the focus of the tender is on the size of the toll or availability payment, this would not necessarily create the incentive for bids that generate the greatest economic value to the community, nor would the tender necessarily reveal the best bidder from that perspective. The adverse consequences of a poorly designed tender process could be magnified by the conflicting incentives

of members of the bidding consortia. The outcome noted by the ISA (box 6.6) is an example of a situation where failure to account for long-term costs and benefits on the procurer's side could drive aggressive financing arrangements, dominated by short-term bank finance and opportunist equity.

The most direct way of addressing those issues is to focus the bidding and subsequent assessment of the bids on the appropriate objective. In this context, the Commission agrees with the general approach in the inverted bid model of bidding on the expected IRR of the project, because this would reflect the economic value of the asset over its life. However, there are several implementation issues.

First, the tender should focus on the expected IRR on unlevered equity. Quarantining capital structure considerations at the tender stage would provide a clearer focus on the true economic value and risks of the project. Expressing the tender objective in terms of economic return on the asset should also discourage the gaming between consortium members, whose conflicting incentives may distort the bidding and tender outcomes. The allocation of the project returns and risks between equity and debt is second order to selecting the bid that maximises aggregate (risk adjusted) economic value. Nevertheless, to the extent that capital structure does play a role, the proposed process retains the flexibility to optimise it via a subsequent debt financing competition (discussed below).

Second, to ensure that the expected IRR is a robust measure and not vulnerable to subsequent manipulation by the winning bidder, the timing and conditions of termination of the asset or its transfer to the government need to be clearly prescribed at the outset. For example, the tender invitation and subsequent contract could specify that the asset would be transferred to the government at no cost after 30 years of operation.

Third, to ensure a transfer of risk to the private parties, it is essential that the expected IRR is converted into a revenue equivalent, which is set before financial close. Depending on the project context, this can be specified explicitly, as a revenue guarantee or cap, or implicitly, as a price/charge that would be expected to generate the revenue stream.[27] The latter arrangement vests some demand risk with the proponent and may be more suitable when a substantial component of the revenue stream can be recovered through user charging.

Fourth, the Commission recognises that setting revenue streams or prices decades into the future, on the basis of an assessment at the beginning of the project's life could place excessive risks on the private party. Thus, some form of 'safety valve'

[27] However, whichever arrangement is selected, it would need to be specified before the tender, to avoid a change in the allocation of the risks after the tender.

to allow a revaluation of the revenue stream (upwards or downwards) is likely to be necessary. This could take the form of a contractual clause allowing periodic renegotiation under specific conditions. The contract would need to prescribe which costs could be reviewed or passed through, and which would remain fixed.

For example, in the building block model of utility regulation, the regulated asset base — a key driver of the regulated revenue stream — can be revalued at the end of each regulatory period. The period is typically set at five years (PC 2013c). However, if periodic renegotiation is adopted, a longer period would likely be warranted, so as not to erode the long-term risk management incentives of the project sponsor.

Unbundled debt financing

As discussed earlier, the requirement to provide fully financed bids is a material impediment to the supply of some sources of finance. Relaxing the requirement for fully financed bids is consistent with the inverted bid model and would be beneficial in this hybrid model. Given the bidding is focused on the long term unlevered IRR and no threshold capital structure is prescribed, the Commission considers that unbundling only debt finance at the tender stage would create a clearer incentive for the participation of long term investors, while not suffering from the potential adverse effects inherent in the inverted bid model. A debt financing competition after the tender to secure the appropriate level and type of debt finance would provide the winning bidder with the flexibility to optimise the capital structure.

Comparing the inverted bid and the Commission's 'hybrid' proposal

The Commission's proposal pursues the same objective as the inverted bid model and adopts a number of its elements (table 6.4).

The Commission considers that its proposed changes overcome some of the shortcomings of the inverted bid model. This modified model also presents a more prudent approach, because it offers a more gradual change over the existing arrangements. Further experimentation with the hybrid model may be merited and could be conducted with pilot studies, experiments or other small-scale projects.

Table 6.4 **Selected features of the current, inverted bid and hybrid models**

	Current process	*Inverted bid model*	*Hybrid model*
Project sponsor	Open to all parties, but current arrangements may favour banks	Open to equity investors only	Open to all parties
Bid selection criteria	Varies, but no consistent focus on economic return	Expected IRR converted into an ex ante revenue equivalent	Expected unlevered IRR converted into an ex ante revenue equivalent
Bundling of project functions	Financing, design, construction and operations fully bundled in a consortium	All functions unbundled and separately tendered for	Debt financing unbundled from the bidding
Certainty on commercial terms and risk allocation	High — fully financed and highly specific bids	Low/Moderate — equity funding competition on a concept case before involvement of designers and constructors	Moderate — non-fully financed bids, but the consortium structure is largely retained
Financing structure	Left to consortia, but current arrangements may favour bank finance	Mandated level of long-term equity contribution	Left to the winning bidder
Competition effects	Bundling mutes competitive signals for individual parties to the consortium	Potential limitations from fixing equity sponsorship and participation levels at an early point; pro-competitive otherwise	Increased competition from unbundling debt financing primarily

6.6 Addressing self-imposed fiscal constraints — capital recycling

Capital recycling has been proposed by a wide range of participants and commentators as a mechanism that could be used by governments (State Governments in particular) to raise the money to fund and finance new infrastructure projects (OIC, sub. 78; IFWG 2012). Unlike mechanisms discussed earlier, this would involve the government essentially taking an initial lead role in financing a project in its early phases before it is transferred to the private sector, after early risk was eliminated or mitigated.

Specific details of the mechanism

In essence, capital recycling involves government privatising mature assets and explicitly hypothecating the proceeds to the financing of new infrastructure projects (or into a dedicated infrastructure fund for a series of projects), which can in turn be privatised themselves once they become mature (BCA, sub. 39; Ergas, sub. 87).

Capital recycling is often promoted as an alternative mechanism to government's funding and financing infrastructure through higher taxes or debt issuance. That said, because government debt is fungible it is technically equivalent to the government using the privatisation proceeds to reduce government debt and financing the new infrastructure project through debt issuance.

This type of model has been used in Australia at the state and local government levels (box 6.8), and has been the subject of widespread discussion by participants and in the broader policy discourse.

Box 6.8 **Capital recycling model in Australia**

- *Natural Heritage Trust*: Following a partial privatisation of Telstra in 1997, some of the proceeds were invested in the new trust with the aim of protecting and rehabilitating Australia's environment. Of the initial funding of $1 billion, $700 million was allocated to five capital projects, including: the National Vegetation Initiative; the Murray-Darling 2001 project; a National Land and Water Resources Audit; the National Reserve System; and a Coast and Clean Seas Initiative.
- *WestConnex Toll Road Company*: Following the NSW Government's long-term leases of Port Botany and Port Kembla, the proceeds were dedicated to an infrastructure fund (Restart NSW). This fund will be used to finance several infrastructure projects in NSW, the first of which is the planned WestConnex toll road. The WestConnex project is also planned to involve a second form of capital recycling, whereby the government will provide equity financing for the first phase of the project, but private sector capital will be raised against toll revenue once the first phase becomes operational to finance the construction of subsequent phases.
- *Newcastle CBD revitalisation*: The NSW Government recently agreed to a long-term lease of the Port of Newcastle. A large portion of the proceeds of the lease will be invested into infrastructure. This includes an amount of $340 million (in addition to $120 million already allocated) for a revitalisation of the Newcastle CBD, which includes a new light rail service.
- *Asset Recycling Initiative*: In the 2014-15 Budget, the Australian Government outlined a scheme which involves a payment to States and Territories of 15 per cent of the price of an asset sold if all of the sale proceeds are allocated to new infrastructure investment. The Australian Government also proposes to establish an Asset Recycling Fund from 1 July 2014 which will be used to make payments to the States and Territories under the Infrastructure Growth Package. Money from the Asset Recycling Fund will be used to help States and Territories sell existing assets and recycle the capital to new infrastructure. The Fund will receive an initial contribution of $5.9 billion from the Building Australia Fund and the Education Investment Fund. It will be managed by the Future Fund Board of Guardians.

Sources: Australian Government (2014a); Baird (2014); BCA (sub 39, attach.); Hill (1997); NSW Treasury (nd).

Barriers to capital recycling — vertical fiscal imbalance

One of the key claimed barriers to greater use of capital recycling relates to State Government concerns about the potential loss of tax equivalent revenue from their existing infrastructure assets.[28]

The Australian Government has recently outlined an Asset Recycling Initiative to encourage capital recycling by State and Territory Governments (box 6.8).

Various other incentive mechanisms have been suggested by participants. One proposal involves the Australian Government introducing some form of tax equivalent incentive payments/grants to State or Territory Governments that privatise publicly owned infrastructure assets and recycle the capital into new infrastructure projects. This proposal has received provisional support from some participants (for example, Property Council of Australia, sub. 53). Other participants have recognised that it could potentially disadvantage State Governments that have already undertaken significant privatisation programs, such as Victoria (Victorian Government, sub. 81; BCA sub. 39, attach.).

An alternative incentive instrument is a tax increment financing mechanism that would enable a portion of the increased taxation revenue generated by the productivity benefits of state infrastructure investment to be provided to the States as infrastructure funding (Victorian Government, sub. 81). Other potential mechanisms raised to encourage capital recycling include scaling back National Partnership payments to State Governments if there is no progress on privatisation and a re-examination of legislation that mandates retention of legacy labour provisions post-privatisation (BCA, sub. 39).

Participants' views on the merits of capital recycling

Participants have argued that there were a range of potential benefits of greater use of capital recycling on both the investment and the privatisation sides.

In terms of new infrastructure investment, the main benefit claimed by proponents was that capital recycling will allow otherwise fiscally-constrained governments to undertake more investment in priority public infrastructure (DIRD, sub. 64; OIC, sub. 78; Ergas, sub. DR182).

[28] Under the National Tax Equivalent Regime, State Governments are the beneficiaries of notional income tax payments made by State-owned enterprises. Post privatisation, the tax revenue would vest with the Australian Government.

Potential benefits have also been claimed on the privatisation side of the equation. One of the principal arguments is that use of this type of mechanism will help alleviate community resistance to privatisation by linking the proceeds very clearly and transparently with the delivery of new infrastructure projects (OIC, sub. 78; BCA, sub 39, attach.). Some participants proposed very large privatisation lists — for example, Infrastructure Australia estimated that there are over $100 billion of infrastructure assets held by Australian governments which could be viable for privatisation (OIC, sub. 78).[29]

On the other hand, participants have identified potential costs and risks with the use of this type of mechanism to finance new public infrastructure.

Ergas (sub. 87) argued that the same factors that lead private investors to be risk averse for greenfields projects should lead the public sector to also be wary of those projects; and 'capital recycling' should not be used as an excuse to inefficiently shift risk on to taxpayers. If projects are inherently risky because their cost and demand characteristics are uncertain in ways that cannot be hedged through diversification, and/or their likely net returns fluctuate with aggregate incomes, then transferring their funding to the public sector cannot in itself eliminate that risk or reduce its costs.

Lend Lease (sub. 46) observed that this type of mechanism could fall victim to overuse which may lead to lower than expected returns and available capital for funding.

Commission's assessment

Capital recycling and efficient decision-making

The Commission acknowledges participant views that capital recycling could allow capital-constrained governments to fund more infrastructure investments. It also does not dispute the argument made by Ergas (sub. DR182) that under some circumstances, it may be efficient for governments to have artificial budget constraints. In those cases, privatisation could relax the constraint and allow governments to increase spending in socially beneficial ways. The Commission also notes a subsequent argument by Ergas (sub. DR182) that the lifecycle risk profile

[29] This analysis indicates that assets in sectors such as airports, bulk ports and electricity generators in the National Electricity Market have suitable regulatory frameworks in place for privatisation to be desirable; while assets in other sectors such as roads, passenger rail and water treatment facilities would require structural and regulatory change before privatisation could be recommended.

and the distribution of the benefits of some projects may make public ownership more efficient at the outset. The case for privatisation would strengthen as the gap between private and social benefits narrows when the project ages. However, this does not address a key issue with capital recycling.

Capital recycling involves the linking of two separate decisions; the decision to privatise state-owned assets, and the decision to invest in a new infrastructure project or set of projects. While the linking of the two decisions may be a useful mechanism to alleviate community resistance to privatisation, this should not replace the need to undertake these sets of analyses separately. Ideally, both sets of decisions would be made within a transparent decision-making environment, where a robust cost–benefit analysis is undertaken, and there is scope for independent review (chapter 2).

The main risk from the capital recycling model is the potential for it to distort either of these decisions. In particular, an arrangement where the proceeds of sale are automatically hypothecated to investment in new infrastructure projects may create risks for over-investment in new greenfields infrastructure which, by its nature, typically involves significant risks in the early construction and operational phases. The crucial issue is effective project selection, which is not addressed by locked-in finance.

For example, there is no a priori reason for the investment of the proceeds from privatisation to be fixed to the same region in which privatisation has occurred (as was the case with the Newcastle CBD revitalisation project). This is an example of a constraint on the investment decision, that excludes other projects and consequently creates a risk of poor project selection.

A further potential risk with capital recycling is that the availability of funds from privatisation may mute the incentives for state governments to properly consider the extent to which user charges can be used to 'fund' the new infrastructure (on the basis that taxpayers feel they have already paid for it); and/or prevent funds from being directed to higher value uses, which may not necessarily be new infrastructure investment.

A final problem with capital recycling is that it might cement in the public a view that the only time an asset should be privatised is if there is some new infrastructure project in which to invest — that is, that privatisation is not of benefit in and of itself.

The potential need for a regulatory regime for privatised assets

There are other potential costs and risks to consider with the use of capital recycling. An important issue on the privatisation side of the equation is whether any necessary regulatory arrangements can be put in place before capital recycling can occur, since public infrastructure assets often have natural monopoly characteristics, or involve externalities, which means they would otherwise be under-provided by the private market. Therefore, due regard would need to be given to whether any new regulatory arrangements (including community service obligations) would be necessary to ensure service delivery needs and community objectives continue to be met.

Incentives for privatisation

Whether the State and Territory Governments have a financial disincentive to privatise their infrastructure assets that needs to be compensated by the Australian Government is debatable. Several factors, such as dividend imputation and productivity gains from privatisation could offset the loss of notional income tax payments. Specifically, if dividend imputation is complete and the purchaser of the enterprise can obtain full compensation of company tax through franking credits, a State Government would not lose from privatisation. Furthermore, if the purchaser is able to operate the enterprise more productively, the price they pay would reflect some of that gain. The State Government would then receive a premium over the (capitalised) revenue stream that would have vested with the government, if the asset stayed in public hands.

Notably, the newly announced asset recycling initiative is presented in terms of 'incentive payments' rather than compensation to State and Territory Governments (Hockey 2014).

Ultimately, even if the case for incentives for privatisation is made and they can be calculated accurately and implemented effectively, the key issue is that the objective of the policy is to remove impediments to efficient privatisation, not capital recycling per se.

Fiscal impact of capital recycling

The net impact on the government's balance sheet through the use of capital recycling is unclear. In effect, a government would be swapping ownership of a mature asset (with known demand and cost characteristics), with ownership of a new (and potentially more risky) greenfields asset (with often unknown demand and

cost characteristics). While government is receiving revenue from the asset sale and avoiding future liabilities (including any contingent liabilities), it would also lose access to the future revenue stream from that asset (be it from dividends or otherwise) and be exposed to a new set of assets and liabilities with less reliable estimates of dividends and other revenue.

Ultimately, poorly conceived decisions to link asset sales to new infrastructure investments could in fact have a negative future balance sheet impact and create long term additional liabilities for government.

On balance, the Commission considers that decisions to privatise a state-owned asset and procure new infrastructure should be separated in time and space. The policy is risky, because it may bypass thorough and transparent analysis. Decisions can be linked to build community confidence for privatisation proposals, but at a minimum, time would need to be allowed to identify the risks.

Governments should avoid creating expectations in the community that privatisation is only good when the proceeds are used for procuring new infrastructure, as this might constrain future governments from optimising their balance sheets in the public interest.

The aims of the Asset Recycling Initiative are laudable. But the risks are significant. As noted above, the Initiative does not obviate the need for good governance and transparent and sound analysis of privatisation and procurement decisions. Only under those constraints can the additional risks of the Initiative be managed in a way that preserves the interests of the broader community.

7 Reforming institutions

Key points

- Reforming governance and institutional arrangements for the provision of public infrastructure is essential to promote better decision making in project selection and the efficient funding, financing and delivery of public infrastructure services.
- The recommendations in this chapter are intended to apply to the development, selection and implementation of public infrastructure projects across all sectors, including transport, water and electricity.
- If governance and decision-making processes are not reformed, more spending will simply magnify the cost of poor project selection and delivery.
- Institutional arrangements for the provision of public infrastructure should incorporate good governance. This includes:
  - effective processes for planning and selecting public infrastructure projects, including rigorous and transparent use of cost–benefit analysis, public consultation, and public disclosure of decisions
  - principles and processes for selecting funding and financing arrangements
  - independent evaluation of the performance of public infrastructure projects.
- In some economic infrastructure sectors, project selection can be strengthened through privatisation or corporatisation subject to good governance frameworks.
- With or without private involvement in infrastructure provision, effective pricing or user charging can also play a central role in strengthening project selection by providing signals for investment decisions based on efficient use.
- Various forms of 'infrastructure funds' have been considered or adopted in Australia and overseas, including as a way to improve infrastructure decision making. However, the formal allocation of revenue to a fund may increase pressure to spend regardless of whether sufficient project evaluation has been undertaken.
- The Commission proposes an approach to strengthen incentives to adopt improved governance arrangements for public infrastructure by making the Australian Government's assistance for, or approval of, public infrastructure projects conditional on State and Territory and Local Governments complying with the set of good governance principles and policies set out in the package of recommendations in this report.

The process of project selection is crucial to efficient public infrastructure provision (chapter 2). This involves not only transparent cost–benefit analysis, but also effective governance and institutional arrangements to guide the selection and

delivery of public infrastructure projects. In recent years there has been a failure to adequately assess the costs and benefits of many public infrastructure projects and subject these assessments to public scrutiny (chapter 2). Corporatisation does not necessarily prevent poor investment decisions if project selection processes do not include rigorous evaluation of alternative options to improve the capacity and quality of public infrastructure.

The Commission has proposed that the Australian Government use its influence and role in the funding of public infrastructure to impose greater discipline on the chain of processes that leads to the selection and delivery of public infrastructure projects across all sectors. This would apply to the energy, water and transport sectors but also any other area where public funds (or public authority) are used to support new infrastructure investment. In using such influence, it is important that the Australian Government accept greater discipline on its own infrastructure provision to set the right example.

This chapter examines the scope for institutional and governance reforms to improve the efficiency of public infrastructure provision for the benefit of the Australian community. It covers:

- current institutional arrangements (section 7.1)
- the case for governance and institutional reform (section 7.2)
- principles for good governance (section 7.3)
- the role of Infrastructure Australia (section 7.4)
- the influence of the Australian Government (section 7.5).

7.1 Current institutional arrangements for infrastructure provision

There is a range of institutional and governance arrangements for infrastructure provision across different levels of government in Australia. These also vary by sector and depend on responsibility assigned to bodies for investment decisions and service delivery which, broadly speaking, can be made by:

- a Minister, government department or agency with delegated responsibility
- a Minister, with responsibility for management or delivery of infrastructure services appointed to a statutory authority
- a government trading enterprise (GTE), with or without economic or other regulation

- a local governing body (a council) with authority to provide services in their local government area
- a private firm, with services possibly subject to economic or other regulation, or through some form of contractual arrangement with government.

Where responsibility for the decision to invest in public infrastructure lies with a Minister and is subject to Cabinet approval, typically the Minister would put forward proposals developed by the relevant government department based on policy objectives set by the government. The responsibility for delivering public infrastructure services may lie with a government department or another government entity. For example, in the roads sector, decisions about project selection have tended to be undertaken by governments. The responsibility for management and delivery of road networks has typically rested with local governments, road agencies or statutory authorities (for example, VicRoads and Main Roads Western Australia).

Local governments are designated under state legislation as responsible authorities for the purpose of undertaking functions and providing services on behalf of other levels of government (including the delivery of infrastructure) within their local government areas. Councils determine service provision according to local needs and the requirements of state and territory local government legislation (DIRD 2013). They generally have the legal ability to charge for services and enter into contractual arrangements (PC 2006a).

In infrastructure sectors, such as urban water and energy, GTEs are generally responsible for investment decisions and the supply of services. However, they vary in terms of the tasks they perform and their accountability to ministers and the government. For example, some government-owned energy utilities require Cabinet approval to build power stations and implement new tariffs. Governments can also impose policy directions on utilities and economic regulators (for example, requirements for time-of-use metering and tariffs). In some instances, governments have made project selection decisions themselves, even though a GTE is responsible for delivering services. For example, governments in some jurisdictions have made decisions about augmenting the supply of water by utilities.

Private sector involvement can include the government taking decisions to invest in projects and then contracting with one or more private firms to deliver the infrastructure and related services (for example, the construction of toll roads). There are various models of private sector involvement in the delivery and operation of road infrastructure, ranging from traditional design-and-construct models to various forms of public private partnerships (PPPs) (chapters 3 and 12).

In the case of a private business, the government may grant a concession or regional monopoly.

Alternatively, governments may privatise entities but subject them to a regulatory framework. This may involve setting service standards or a framework for setting prices and devolving responsibility for investment and financing decisions to the private entity.

To assist infrastructure decision making, governments at different levels have established specialist bodies (either as independent agencies or units within government departments) to provide advice on the provision of public infrastructure. For example, the Australian Government established Infrastructure Australia (IA) as an advisory body to governments, investors and infrastructure owners on a range of issues, including:

- Australia's current and future investment needs
- mechanisms for financing infrastructure investments
- policy, pricing and regulation and their effects on the efficiency of the delivery, operation and use of national networks (*Infrastructure Australia Act 2008* (Cwlth), s. 5).

Some other jurisdictions have created advisory bodies on public infrastructure matters. For example, Infrastructure NSW has been established to provide advice to the NSW Government on infrastructure priorities and long-term planning. Most State Governments have established specialist infrastructure units within government departments to advise on procurement and financing models. For example, Partnerships Victoria and Projects Queensland prepare evaluations of projects with potential to be delivered as PPPs and manage tender processes and contract negotiations.

Coordination and planning between levels of government

Some infrastructure projects involve multiple levels of government. This includes where there are inter-jurisdictional spillovers, areas of joint responsibility between levels of government, or the decision to proceed with a project at the State or Local Government level is dependent on Australian Government funding.

There are several existing mechanisms through which governments seek to coordinate decision making around the planning and provision of public infrastructure, for example:

- Council of Australian Governments (COAG) Standing Councils provide a forum for collaboration between levels of government to address areas of shared responsibility for provision and funding, and to progress key reforms in specific infrastructure sectors. This includes the Transport and Infrastructure Council and the COAG Standing Council on Energy and Resources.
- Policy frameworks and plans have been implemented to help guide and improve decision making and coordination between different levels of government, such as the National Ports and Freight initiatives and National Public Private Partnership Policy and Guidelines endorsed by COAG.
- COAG sought advice on major transport reforms, including proposals for Heavy Vehicle Charging and Investment (HVCI) reform.

Governments have also established bodies with responsibility for assessing progress in implementing reforms in specific sectors. For example, the National Water Initiative was agreed by COAG in 2004 to achieve a more cohesive approach to water reform in the areas of water planning, management, measurement, pricing and trading. This led to the establishment of the National Water Commission to oversee water reform progress.

Funding for the Australian Government's national Infrastructure Investment Program for road and rail is provided under the *Nation Building Program (National Land Transport) Act 2009* (Cwlth). State Governments submit proposed projects for assessment by the Australian Government against strategic priorities, including whether they are listed on IA's priority list and meet relevant economic viability criteria (DIRD, sub. 64). In developing national infrastructure audits and priority lists, IA has primarily relied on submissions from State Governments.

7.2 The case for governance and institutional reform

In preceding chapters of this report, a number of areas were identified where the adoption of good practice governance arrangements and reforms to institutions would lead to more efficient public infrastructure provision. Some consistent themes are:

- deficiencies in project selection and governance
- lack of transparency around project selection and other decisions
- government bias towards large 'iconic' projects
- lack of capabilities in public sector agencies to negotiate and manage complex contracts, including the efficient and credible allocation of project risks

- deficiencies in long-term planning and coordination, including corridor preservation.

Deficiencies in project selection and governance

There are numerous examples of deficient project selection and inadequate assessment of the costs and benefits of public infrastructure projects leading to inefficient outcomes (chapter 2). The decisions made by governments can become politicised, and are often based on inadequate information and assessment of the costs and benefits of projects, especially where projects are pre-election commitments. Evidence from Australia and internationally suggest there can be significant differences between *ex ante* estimates and *ex post* outcomes of the costs and benefits of major public infrastructure projects.

Privatisation and corporatisation of public infrastructure have generally improved project selection efficiency, although this depends in large part on the policy and regulatory frameworks put in place by governments.

Poor investment decisions are not unique to governments. They are also made by the private sector. However, when governments make mistakes regarding major public infrastructure projects, the consequences impact more broadly by the community, including users and taxpayers. Given the magnitude of resources allocated to infrastructure, the consequences of bad decisions, including the failure to select projects with high net benefits, are evident for many years. Such decisions can, and do, crowd out the provision of superior infrastructure projects.

Some participants have suggested that deficient governance arrangements may have contributed to unsatisfactory outcomes in the delivery of projects. A report prepared for IA found that 48 per cent of projects failed to meet their baseline time, cost and quality objectives, and identified governance as a major contributor to project failure (Office of the Infrastructure Coordinator sub. 78).

Similarly, Industry Super Australia commented:

> Poor project governance in Australia is a major reason why infrastructure projects fail to meet their timeframe, budget and service delivery objectives. Australian governments must improve procurement and transaction management processes to: reduce tender, construction and operational cost; increase schedule reliability; eliminate fees leakage; eliminate windfall operational profits, and promote innovation. (sub. 60, p. 24)

Lack of transparency

Some participants have suggested that greater transparency around project selection is key to improved outcomes in public infrastructure. For example, as noted in chapter 2, Forsyth (sub. DR117) commented that there are several gains that arise from open and transparent evaluations. These include that analysis can be independently tested, key assumptions can be debated and additional studies may be commissioned to improve understanding of the underlying policy problem. Transparency can also be considered necessary to demonstrate that stakeholders have been consulted and that value is seen to be delivered to the public (Institute of Value Management, sub. DR125).

The NSW Business Chamber (sub. DR148) commented that public transparency of the project analysis undertaken by bodies such as IA and Infrastructure NSW would help hold governments more accountable to their project selection processes.

Participants have also raised concerns about transparency with respect to the latter stages of the decision-making process, such as the decision to use, and the structuring of, PPP arrangements. For example, Hodge (sub. DR151) commented that some of Australia's PPP arrangements have been too secretive, and that there is a crucial need for governments to improve transparency to improve the legitimacy of private finance structures.

Government bias towards large projects

Some participants have suggested that the current arrangements for project selection and prioritisation tend to favour larger more iconic projects over smaller scale projects that could yield higher net benefits to the community. There may be potential benefits from the aggregation or bundling of smaller projects that have a higher benefit–cost ratio. The preference for iconic projects can also come at the expense of smaller-scale projects that address particular bottlenecks or lead to more efficient use of existing infrastructure.

For example, the Bus Industry Confederation commented:

> … we have serious doubts about whether current land use/transport planning and decision making processes are producing the right kinds of projects. In particular, our 'big project' mentality is, we believe, distorting a systemic approach to infrastructure planning and prioritisation (among other things). (sub. 43, p. 19)

Similarly, Ergas noted:

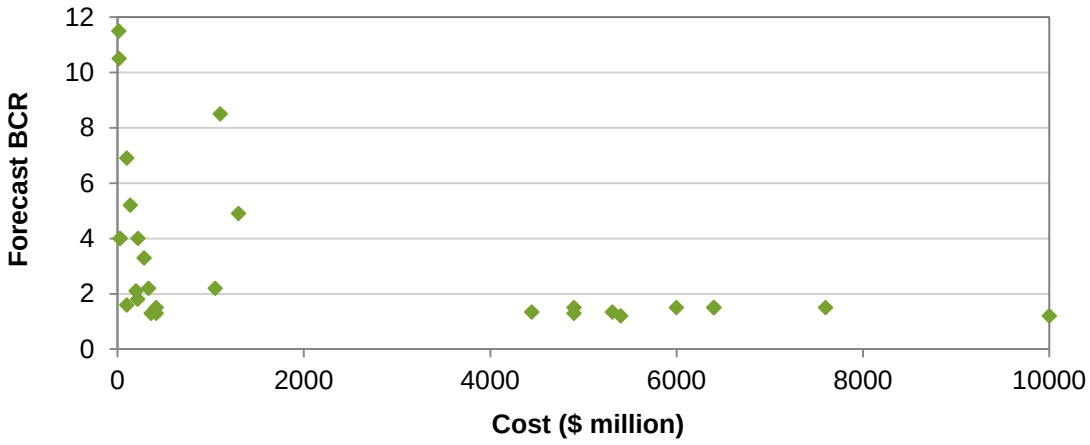
> Commonwealth funding for infrastructure has become increasingly project specific, accentuating a bias in infrastructure decision making to large, politically salient, projects. (sub. 87, p. 18)

Although it was supportive of strong governance arrangements that ensure project selection is based on rigorous cost–benefit analysis, the Association of Superannuation Funds of Australia (sub. DR139) noted the importance of ensuring that the cost of conducting such analysis does not bias large projects over smaller ones.

The tendency for smaller projects to have higher benefit-cost ratios is reflected in submissions to IA over recent years (figure 7.1). The Office of the Infrastructure Coordinator (sub. 78) indicated that this trend reflects that smaller projects are more likely to be targeted at addressing problems that are preventing better use of the wider network.

Figure 7.1 **Benefit–cost ratios versus cost**

Projects submitted to Infrastructure Australia[a]



[a] Incudes project proposals that are submitted by State Governments for inclusion on IA's priority list that are 'ready to proceed' (those with strong strategic and economic merit that have met all of IA's criteria) or 'threshold' projects (those that are well developed and present a detailed preferred option). Other projects that are early stage or approved by State Governments are not included.

Sources: Infrastructure Australia (2011, 2012a, 2013a).

A related issue is whether project selection processes under current Australian Government funding programs disadvantage local governments. The roles and responsibilities of local governments for delivery of public infrastructure differ across Australia. Some of the largest councils, such as the Brisbane City Council and the Gold Coast City Council, are directly responsible for identifying and prioritising major infrastructure within their jurisdiction. However, their projects may be rated by the Australian Government as a lower priority than those proposed

by State and Territory Governments, or be below the threshold to be considered eligible for an Australian Government funding program.

The Council of Capital City Lord Mayors noted that:

> A weakness experienced by capital city councils is the ability to access funding, particularly from the Federal level, outside of "one-size-fits-all" programs such as Roads to Recovery. While still beneficial in enabling smaller scale projects, this limits the ability of Australia's larger councils to fund major projects. For instance, Brisbane City Council has been unable to secure funding for some larger projects through IA in part because it appears to be in competition for funding with the Queensland Government. (sub. 73, p. 6)

Some of these concerns can be addressed directly through the adoption of reforms proposed in chapter 8, including the establishment of road funds at the local government level.

Project delivery and public sector capability

The use of private procurement models can contribute to improving efficiency in the delivery of some types of public infrastructure (chapter 3). However, achieving better outcomes depends on a range of factors including the policy and regulatory frameworks put in place, the effectiveness of risk allocation, and the design of appropriate user charging arrangements. In cases where user charging is impractical, governments need to fund the provision of public infrastructure either wholly or partially. Given mixed evidence on the benefits of PPPs (appendix B), it is necessary to undertake careful assessment about whether they offer greater net benefits compared with other procurement models.

In some cases, governments have also come under pressure (and have succumbed to this pressure) to provide assistance for privately provided public infrastructure projects that have faced financial difficulties even though risks were allocated to the private sector (chapter 3).

Some participants questioned the capability of public sector agencies to identify and allocate project risks and manage complex contractual relationships with the private sector. For example, the Office of the Infrastructure Coordinator (sub. 78) commented that the public sector does not currently have the skills and capabilities to analyse and negotiate complex infrastructure transactions. It pointed to the need to build capabilities to oversee the use of different funding and financing models.

The Victorian Government (sub. 81) commented that effective governance requires bodies with a breadth of knowledge covering a range of areas including legal,

financial, operational, and construction management. It supported current initiatives to improve skills and capabilities through the COAG Infrastructure Working Group, including a national forum for contract managers and a national training program.

Consult Australia (sub. 23 and DR168) called for the creation of a procurement centre of excellence as a potential solution to the critical shortage of procurement skills in the public sector. Similarly, the International Centre for Complex Project Management (International Centre for Complex Project Management, sub. 105) recommended the establishment of a specialist research centre to improve the management and delivery of complex infrastructure projects and programs in collaboration with existing efforts being undertaken by ICCPM and its partner research institutions.

Evidence on the skills of public sector clients to manage contracts for major infrastructure projects, and the impacts on delivery performance in terms of cost and time overruns is discussed in chapter 12.

Long-term planning and coordination

A number of participants commented on the need to improve long-term planning and coordination of public infrastructure provision across levels of government. For example, the Department of Infrastructure and Regional Development considered that there had been a disconnect between IA's priorities and state government strategic plans:

> Often jurisdictional strategies have focused on one preferred scenario and project priorities which do not address nationally significant network gaps or which do not consider long term implications for national growth. (sub. 64, p. 13)

The Business Council of Australia (BCA) (sub. 39) considered that governments needed to redefine and better coordinate their roles. It suggested that governments need to prioritise better infrastructure planning, regulation and innovative funding and financing models that attract private investment.

The Urban Development Institute of Australia (UDIA) (sub. 40) commented that processes for project selection, planning and implementation of infrastructure vary across State and Local Governments, with objectives that may compete or conflict with other areas and levels of government.

The HVCI reform project (sub. 77) identified weak coordination in long-term planning for local, state and national road providers as one of several problems contributing to inefficient road provision.

Some participants have suggested there is a need to establish independent agencies to provide advice on infrastructure planning and priorities (Business SA, sub. 31; Civil Contractors Federation, sub. 34; Engineers Australia, sub. 26).

Corridor preservation

The importance of preserving land for transport corridors and other types of infrastructure, given expected demographic change and increased demand, was raised by several participants (DIRD, sub. 64; Office of the Infrastructure Coordinator, sub. 78; Smart Infrastructure Facility — University of Wollongong, sub. 94).

Delays in identifying and acquiring land to be set aside for future corridors has the potential to significantly increase the cost of the development and ongoing operation of infrastructure, which in turn, may distort project selection decisions. Failure to protect corridors or adequately reserve land can result in development encroaching on preferred routes, selection of sub-optimal routes or expensive alternatives (such as tunnels, which can be eight to ten times more expensive than comparable surface alternatives) (Office of the Infrastructure Coordinator sub. 78 and DR185; SCOTI (2012b); UDIA, sub. 40).

The costs of acquiring land for corridor preservation are influenced by the legislative requirements for compensation of land holders, which vary across jurisdictions. Some participants noted that purchasing land upfront, once the future need is identified, can dramatically reduce land acquisition costs (Council of Capital City Lord Mayors, sub. DR160; Evans and Peck, sub. DR175; Office of the Infrastructure Coordinator sub. DR185). The purchase costs of land have also been identified by others as a significant driver of infrastructure construction costs (chapter 9).

Corridor reservations can potentially last decades. Given this, the credible allocation of reserves for alternative uses prior to the development of infrastructure, such as through earning rent from landholders, can be of significant value and accrue revenues to governments. That said, governments need to be confident that when a project is being developed, access to the corridor will not be thwarted.

Corridor preservation can be impeded, or the net benefits reduced, by developments on land adjacent to corridors. The construction of residential dwellings in proximity to transport infrastructure, potentially results in adverse noise, vibration and other amenity impacts for future residents. Thus, environmental land use planning systems and regulation can significantly affect the cost of infrastructure provision. Without effective coordinated planning controls over a sustained period, there will

be difficulties protecting transport corridors or precincts from encroaching development and incompatible use of adjoining land.

One example provided by the Office of the Infrastructure Coordinator (sub. DR185, attach.) is the high density development to be permitted near the Port of Fremantle next to the freight line to the port. The risk of potential noise complaints associated with operation of the rail line could result in regulatory requirements imposed on future rail operations which could affect the productivity of the port logistics chain.

Some state governments have an active role in managing such developments through land planning strategies and guidelines. For example, the NSW Government's Infrastructure State Environmental Planning Policy includes guidelines for developments proposed in or adjacent to specific roads and railway corridors (NSW Government 2008). The Western Australian Planning Commission uses policies, including the Metropolitan Region Scheme, when determining approval of development applications (WA Government 2004). Land reservation schemes have also been applied to areas designated for future use as ports, airports and power stations. For example, land was reserved by the Australian Government for the building of the Badgery's Creek airport, protected by a 'buffer zone' (Parliament of New South Wales 2006).

There may be potential benefits of improved planning for shared corridors across infrastructure types. For example, unnecessary duplication of construction costs could be avoided if transport corridors are used jointly by providers of road infrastructure and other infrastructure, such as power lines or pipelines used in energy transmission and distribution. This would also improve knowledge of the location of buried infrastructure, such as telecommunications cables and gas pipelines. The maintenance and upgrading of such infrastructure can be particularly difficult where its location is not well documented as part of a central register. Moreover, potential damage to buried infrastructure can be a significant contingent cost for major urban transport projects.

There is currently no national agreement between jurisdictions on corridor protection, although both the National Ports Strategy and the National Land Freight Strategy include provisions supporting the need to protect corridors (SCOTI 2012b). Some jurisdictions have, or are in the process of, developing corridor protection as part of their land planning strategies. For example, the NSW Government (sub. DR171) is developing a corridor protection and management strategy as part of its infrastructure strategy and metropolitan transport plans.

There are different views among participants on how corridor preservation should be achieved and the merits of a national regime. The Office of the Infrastructure

Coordinator (sub. 79 and DR185) argued that governments are better placed than the private sector to protect corridors because of their land acquisition powers and ability to commit to long-term land holdings. Given this, it proposed that Australian jurisdictions should share responsibility for corridor protection measures as part of a national strategy. This would apply to corridors and sites that are intended to handle nationally significant transport flows, including those associated with:

- major export and import gateways
- principle interstate freight networks
- substantial passenger flows between major centres in Australian capital cities.

Some participants supported a national approach to land and corridor preservation, via the establishment of some form of funding facility or national land bank (Council of Capital City Lord Mayors, sub. DR160; Smart Infrastructure Facility — University of Wollongong, sub. 94).

Potential problems with a national regime were also identified. The Chamber of Minerals & Energy of Western Australia (CME) (sub. DR132) commented that a national regime would be problematic given variation in state planning approaches. The Local Government Association of Queensland (sub. DR143) commented that any land corridor and site preservation strategies should have appropriate regard to local government planning on behalf of the local community.

An alternative approach is for the Australian Government to assist in setting the overarching framework and strategy for corridor protection. The Victorian Government (sub. DR196) stated that such an approach could be managed through the existing IA project appraisal process. It suggested this could involve the acknowledgment of common protection principles and Australian Government contributions to corridor protection costs for nationally significant infrastructure. Similarly, Evans and Peck (sub. DR175) supported the establishment of nationally consistent processes and guidelines to guide the protection of corridors that cross jurisdictional boundaries. In its view, this would provide a basis for testing the efficiency and cost of land corridor and site protection strategies at the individual jurisdictional level.

Commission's assessment

Based on the information available, the Commission agrees that corridor preservation is an issue that requires active attention by State and Territory Governments. Each state has different policies for compensation in the event of land resumption. The costs of land acquisition are generally likely to exceed the current opportunity costs of corridor preservation through state-based planning laws or

strategies. A national approach to corridor preservation by land purchase would require agreement on sharing the costs of corridor protection, potentially resulting in a significant shift in responsibilities between levels of government.

The Commission considers that no participant offered a compelling argument — beyond the question of its greater fiscal capacity — for the Australian Government to assume responsibility for funding corridor protection measures. Accordingly, it is unconvinced of the need for a national approach to corridor preservation. There may nevertheless be benefits from the Australian and State and Territory Governments articulating a set of consistent principles to guide land planning strategies — in particular for cases where there are inter-jurisdictional spillovers, such as with transport corridors that span across borders. Consistent with this view, chapter 16 identifies some areas where a jurisdiction and the Australian Government might enter into a bilateral agreement on infrastructure policy and process covering other recommendations in this report. Where national land preservation priorities are evident to both parties (a judgment beyond the scope of this inquiry), they could also agree to jointly support infrastructure oriented corridor preservation. This could include, for example, protection of corridors or sites that are essential to facilitate access to Australia's major ports and related supply chain infrastructure.

Summing up the case for reform

Many of the problems with infrastructure provision identified in this report stem from deficiencies in the institutional and governance arrangements underpinning the provision of public infrastructure.

Inquiry participants have raised a number of concerns relating to suboptimal project governance, a lack of transparency, and a bias toward large projects in project selection with insufficient long-term planning and coordination for public infrastructure. There is evidence (as outlined in preceding chapters) of inadequate and unpublished cost–benefit analyses, overly optimistic demand forecasts, insufficient assessments of project risks, and inappropriate allocation of project risks between public and private partners.

In some cases, improving the provision of public infrastructure depends on the quality of information provided by private sector participants as project proponents. Ultimately, however, it is the role of governments to put in place appropriate governance arrangements and processes to ensure the provision of high quality information to assist decision making.

In the Commission's view, many of the problems identified can be addressed by reforms to current institutional and governance arrangements.

FINDING 7.1

Institutional and governance arrangements for the provision of much of Australia's public infrastructure are deficient and are a major contributor to unsatisfactory outcomes.

Privatisation of public infrastructure in Australia has generally occurred in those sectors with well-established direct user charging arrangements (chapter 2). Privatised entities can deliver good outcomes when they operate as commercial businesses with revenue sourced primarily from user charges and other pricing mechanisms with limited recourse to public finances (apart from community service obligations). This creates stronger incentives for project selection of benefit to consumers and improvements in service delivery, although this depends on effective policy and regulatory frameworks being put in place by governments. The proposed reforms relating to privatisation of some remaining publicly owned infrastructure would improve the efficiency of public infrastructure in some sectors.

The main focus of the reforms in this chapter is on the scope for governance and institutional reform for provision of infrastructure for which there is limited capacity to apply direct user prices or there is an absence of pricing mechanisms. In such cases, some level of government funding can be appropriate due to public good characteristics, positive externalities and equity goals. In these circumstances, there is a greater need for robust governance frameworks to ensure the efficient provision of public infrastructure. The greater the dependency on government funding sources, the more challenging the design and implementation of good governance arrangements will be.

7.3 Principles for good governance

The concept of 'governance' refers to the use of institutions, structures of authority and other bodies to establish policies and rules, to allocate resources for implementation and to coordinate and control the resulting activities (PC 2011).

Strong and effective governance arrangements are fundamental to achieving the efficient provision of public infrastructure services to the community. They play an important role in creating strong incentives for the selection and delivery of public infrastructure projects and decisions on appropriate risk allocation, funding and financing that would generate greater net benefits to the community. They can also be used to review performance and develop learnings from past failures and successes, which can further improve project selection and management over time.

It is useful to articulate a set of best practice governance principles by which existing arrangements can be assessed and suggested improvements made. There are many formulations of good governance and there is no universal set of principles that should be applied to all infrastructure sectors. However, generally accepted elements of good governance include clear lines of accountability and responsibility for decision makers, a strong disposition to transparency of processes and appropriate capability for the public sector to carry out its functions (box 7.1).

Decisions relating to the provision, funding and financing of public infrastructure should be based on an objective consideration of overall costs and benefits, and not designed to meet short-term political interests or result from undue influence of any one stakeholder or group. That is, decisions should be informed by evidence-based analysis within the overarching objective of providing the highest possible net benefits to the community.

In principle, this can be facilitated by clearly defining the division of responsibilities between elected representatives (which may relate to 'public interest' or policy considerations) and those entities charged with developing investment plans and delivering infrastructure services. It also involves making these entities accountable for achieving objectives and performing functions. Even where responsibility for investment decisions is devolved to a government body or another entity, the nature of public infrastructure means that governments still play an essential role by setting desired objectives, outcomes, policy frameworks and decision-making processes.

Box 7.1 Some principles of good governance

Accountability and responsibility

Accountability can be achieved through a process whereby decision makers are assigned functions and held responsible for their decisions and actions and submit themselves to external scrutiny. It is important that all parties have clearly defined roles and a clear understanding of their responsibilities. Governments can contribute to improved accountability by setting clear objectives, providing policy guidelines and defining the functions of the agency or entity responsible for procuring and delivering the infrastructure.

Broadly speaking, within governments, responsibility for procuring public infrastructure rests with either a department (such as departments of infrastructure, health, and education) or a stand-alone government body (such as a government trading enterprise). One of the most important elements of institutional arrangements concerns the level at which responsibility for decision making occurs. In particular, the way in which ministers and parliaments govern infrastructure procuring agencies can influence

(Continued next page)

Box 7.1 (continued)

the performance of those agencies and ministers and the extent to which they can be held accountable for outcomes.

Transparency

Transparency is required so that the community can determine whether they have confidence in, and willingness to pay for, the decisions and actions taken by government and public sector agencies in relation to public infrastructure. Transparency can be achieved through the provision of public information about how the government and procuring agencies are operating and undertaking their functions. For example, in the case of project selection, transparency can be facilitated by making cost–benefit analysis and project selection criteria publicly available, as well as through regular monitoring, reporting and independent performance reviews of previous projects.

Capability

Government entities require appropriate resourcing and capability to carry out their functions effectively (this includes financial resources and suitably skilled staff). For example, public sector procurement agencies require skills in identifying and allocating project risks, designing and implementing complex contractual arrangements with the private sector, and managing the delivery of large complex infrastructure projects.

Sources: ANAO (2003b); PC (2011a).

In the Commission's view, regardless of the specific institutional design adopted, it is imperative that the provision of public infrastructure incorporates strong and effective governance arrangements that reflect best practice.

RECOMMENDATION 7.1

All governments should put in place best practice institutional and governance arrangements for the provision of public infrastructure. This includes:

- ***clearly defining the principal objective of ensuring that decisions are undertaken in the public interest, taken to be the wellbeing of the community as a whole***
- ***setting clear and transparent public infrastructure service standards***
- ***instituting effective processes, procedures and policy guidelines for planning and selecting public infrastructure projects, including rigorous and transparent use of cost–benefit analysis and evaluations, public consultation, and public reporting of the decision***

- ***use of transparent, innovative, and competitive processes for the selection of private sector partners for the design, financing, construction, maintenance and/or operation of public infrastructure***
- ***ensuring efficient allocation and subsequent monitoring of project risks between government and the private sector***
- ***regularly reviewing funding and financing policies, including application of transparent user-charging mechanisms as the default setting where this is efficient***
- ***monitoring of project performance and ex-post independent evaluation and publication of project outcomes (including periodic reporting of benchmark costs by Infrastructure Australia)***
- ***retaining sufficiently skilled public sector employees to be responsible and accountable for performing these functions***
- ***establishing mechanisms for transparent review or audit of the decision-making process by an independent body, for example, an Auditor-General or Infrastructure Australia.***

Decision-making processes should ensure that prior to seeking government funding, all opportunities are exhausted (where it is efficient to do so) for users and other beneficiaries to fund the infrastructure through measures such as user charges, betterment levies and property development charges (chapter 4).

There was broad support from inquiry participants for the adoption of good governance and institutional arrangements that promote transparency of evaluations in decision-making processes (for example, Association of Superannuation Funds of Australia, sub. DR139; Australian Constructors Association, sub. DR169; Australian Sustainable Built Environment Council, sub. DR164; CME, sub. DR132; Consult Australia, sub. DR168; Engineers Australia, sub. DR123; Local Government Association of Queensland, sub. DR143; NSW Business Chamber, sub. DR148; Property Council of Australia, sub. DR131).

7.4 The role of Infrastructure Australia

The Australian Government has proposed reforms to the role of IA in the Infrastructure Australia Amendment Bill 2013. Key elements include:

- re-establishing IA as a separate entity under the *Commonwealth Authorities and Companies Act 1997* (Cwlth)
- more clearly defining the functions and deliverables of IA

- ministerial discretion to limit the class of project proposals considered by IA
- ministerial approval to publish certain materials produced by IA, such as evaluations.

In developing infrastructure plans, IA will be required for each proposed priority project to report on anticipated productivity gains and the complementary infrastructure required to maximise productivity gains. IA will also be required to undertake an evidence-based audit of Australia's infrastructure base in collaboration with the states, and to develop a 15-year pipeline of major infrastructure projects (to be revised every five years) based on national, state and local priorities.

Stakeholder's views

Some participants in this inquiry commented on the IA Bill and emphasised that any changes to IA's role should improve, not diminish, its independence and transparency of decision making (Bus Industry Confederation, sub. DR127; NSW Business Chamber, sub. DR148).

A report by the Senate Rural and Regional Affairs and Transport Legislation Committee (2014) recommended that the IA Bill be passed in its current form. The Senate Committee's overall view was that the Bill would strengthen IA's role as an independent and transparent advisory body through clarification of functions and a governance structure that is legally separate from the Australian Government. Further, it considered that the Bill would widen the remit of IA while imposing reporting and publishing obligations.

Although a number of submitters to the Senate Committee's inquiry supported the IA Bill, some raised concerns with specific aspects.[30] This included the proposed ministerial discretion to exclude IA from examining certain classes of infrastructure, and publishing its evaluations or any evidence relied upon without written ministerial approval.[31]

In response to these concerns, DIRD noted that the Bill provides the Minister the power to exclude a class of proposals from IA's functions to facilitate the Government's policy that IA assess all projects across economic and social infrastructure (excluding Defence projects) that seek Australian Government

[30] Consult Australia, Moving People 2030 Taskforce, Tourism and Transport Forum, submissions to the SRRATLC (2014).

[31] Clauses 5A(2) and 5(D)(1)(b) respectively of the Infrastructure Australia Amendment Bill 2013.

funding of over $100 million.[32] This power would be exercised by a legislative instrument disallowable by Parliament. On the issue of transparency, the Department noted that the intention of the proposed changes was to provide a requirement for IA to publish evaluations and other documentation while also ensuring that it would be able to safeguard commercially sensitive information.

Commission's assessment

Notwithstanding the current and foreshadowed role of IA (and also of state and territory agencies such as Infrastructure NSW), the role of such bodies generally remains advisory. In most cases, final project selection decisions are made by the relevant government or by responsible agencies. To be useful in the long term, it is important that an independent and capable IA provide public clarity on the quality of those decisions, and hence discipline on the temptation for short-term and politically expedient decision making.

The governance arrangements for IA should be consistent with the principles outlined in the preceding section (and reflected in recommendation 7.1). Independence of IA alone is insufficient if there is also a lack of transparency regarding its analysis and the advice it provides to government. Good governance also requires disclosure of the evidence base that supports decisions. This provides transparency on how and why projects are planned and prioritised, and in doing so, greater confidence to taxpayers that governments' (and the community's) scarce resources are being well spent.

The treatment of commercially sensitive material should be considered as part of IA's evaluation processes. However, there are standard commercial sector approaches to protecting such information where it is clearly material to a competitive tender. Moreover, claims for commercial sensitivity are often overstated — there are rarely proprietary cost bases used in normal infrastructure cost–benefit analysis. International practice in countries such as the United States suggests a trend towards increasing transparency rather than suppression of cost-benefit analyses (chapter 2).

The normal expectation in the future should be that tendering for a Government contract will result in the public release of full cost-benefit information. This includes the full details of cost-benefit assessments used by IA which support a

[32] Under the proposed amendments, projects that do not meet the definition of nationally significant, including social infrastructure could be subject to evaluation by IA by a ministerial determination. Projects not seeking Australian Government funding of over $100 million could be excluded by a determination.

funding request by a State or Territory Government and all relevant underlying assumptions and methodologies used in the estimation of wider economic benefits.

Exemptions from public disclosure for genuinely commercially sensitive material should be granted in very limited circumstances. The proposed board of IA should be sufficiently competent to make such decisions, and if necessary, take appropriate advice. To assist in these deliberations, IA should adopt clear processes (based on policy guidance) for assessing the veracity of commercial-in-confidence claims, similar to those used by various government agencies and regulators. For example, the Australian Energy Regulator and the ACCC provide guidelines for assessing the confidentiality of information provided by businesses in undertaking their regulatory functions.

RECOMMENDATION 7.2

The Australian Government should not proceed with those amendments to the Infrastructure Australia Act 2008 that restrict Infrastructure Australia from publishing information on project proposals it has evaluated, including cost-benefit analyses. The Board of Infrastructure Australia should have the power to limit the publication of information if, in its view, this would be likely to cause significant commercial harm to a government, individual or corporation. The Board should make it clear to project proponents and sponsoring governments that all information will be publicly disclosed except in these limited circumstances, and that it will not accept redactions in project proposals.

In addition to the disclosure of cost-benefit information, the practice of publishing benchmark costs based on the performance of similar projects should be encouraged, similar to initiatives introduced in the United Kingdom (chapter 9). In the Commission's view, greater public sector scrutiny of projects compared with cost benchmarks would facilitate competition between tenderers and improve the public's understanding of the very expensive nature of some investments. The Commission has proposed the development and implementation of a benchmarking framework for major infrastructure projects in Australia (chapter 9). It is anticipated that IA would outsource the development and implementation of this framework to agencies with expertise in the relevant areas and would be responsible for publishing the benchmarking results.

It is important to note that the scope of this inquiry extends to *all* public infrastructure where governments have a substantial role in ensuring adequate provision. Many infrastructure proposals are assessed through decision-making processes at the state level and are not provided to IA for evaluation. Governments at all levels have not to date undertaken comprehensive reviews of the full breadth and adequacy of the current stock of public infrastructure. This includes potential

projects crowded out by government proposals such as unsolicited proposals. Therefore, the application of the proposed reforms requires IA to make greater use of sources of quality benchmarking information to assist in the planning and evaluation of future projects (recommendation 9.2).

7.5 The influence of the Australian Government

The Commission's preferred approach is for public infrastructure to be funded through user charges to the extent that it is efficient and cost effective (chapter 4). However, as noted throughout this report, there are instances where full cost recovery through direct user charging may not be feasible or cost effective given current technology. Moreover, it may not be optimal given the nature of public infrastructure and equity considerations. Consequently, a significant proportion of public infrastructure, including roads and public transport, are likely to continue to be at least partially funded by government.

In these circumstances, infrastructure should be funded by the most efficient taxes — those that distort the economy least or those with the lowest marginal excess burden of taxation. These include broad-based taxes on income, consumption, or land (chapter 4). In Australia, the state and territory governments effectively only rely on a limited range of broad-based taxes — other than land tax — yet they are responsible for the largest proportion of expenditure on public services.[33] This gives rise to 'vertical fiscal imbalance' and a reliance on financial transfers from the Australian Government to support the service delivery responsibilities of the States and Territories.[34] Local governments with responsibilities for infrastructure service delivery also rely on funding from both the Australian Government and their respective State or Territory Government, as well as their rate bases and a capacity to charge fees for use.

Current arrangements for Australian Government funding

The Australian Government provides funding to Local, State and Territory Governments through a number of arrangements (box 7.2). These include:

[33] Payroll taxes can be efficient and broad based if applied with limited exemptions. The states also have sufficient legal authority to levy income taxes.

[34] Under the *Intergovernmental Agreement on Federal Financial Relations,* the States and Territories are entitled to receive payments from the Australian Government equivalent to the revenue received from the GST, but less an amount which includes the agreed costs incurred in administering GST (Australian Government 2014d).

- untied funding, such as the GST, which can be used for any purpose
- funding tied to infrastructure, including through specific grant programs and one-off funding for infrastructure projects. Some examples of infrastructure specific funding are provided in table 7.1.

Box 7.2 **Australian Government funding to Local, State and Territory Governments**

The Intergovernmental Agreement on Federal Financial Relations (2011) establishes the overarching framework for the Australian Government's financial relations with the States. It provides three broad forms of funding to support the service delivery requirements of the states.

National Specific Purpose Payments (National SPPs) and National Health Reform funding to be spent in specific service delivery sectors (schools, skills and workforce development, disability services, and affordable housing).

National Partnership Payments (NPPs) in the form of payments to:

- support the delivery of specified outputs or projects
- facilitate implementation of reforms
- reward jurisdictions that deliver nationally significant reform.

Infrastructure specific funding to State and Territory Governments is directed through NPPs (some are also provided to local governments). NPP payments include funding established through National Partnership Agreements as well as funding provided through a range of competitive and discretionary infrastructure grant programs, including the Building Australia Fund, Black Spot Program, and Roads to Recovery fund. In 2014-15, $5.7 billion of infrastructure related NPPs is to be paid to the states and territories.

General Revenue Assistance, consisting of GST payments that can be used by the states for any purpose, and other general revenue assistance. Investment in infrastructure required to provide an average level of services is taken into account in the approach used by the Commonwealth Grants Commission in assessing the state relativities for GST distribution.

The Australian Government also provides assistance to local governments through financial assistance grants via the States. These grants consist of two components. A general purpose component, which is distributed between the States and Territories according to population, and an identified local road component, which is distributed according to fixed historical shares. Both components are untied in the hands of local governments allowing councils to spend the grants according to local priorities.

Sources: Australian Government (2014c); CGC (2013).

The processes and criteria used to allocate infrastructure funding vary depending on the nature of the specific program. GST payments to the states and territories and

financial assistance grants to local governments are untied. Thus, although Australian Government funding may account for a large share of infrastructure spending at the local, state and territory level, it has limited capacity to directly influence such spending.

Table 7.1 **Examples of current and proposed infrastructure funding programs**

	Australian Government contribution[a]	*Criteria for allocation of infrastructure grants*
Asset Recycling Initiative	\$5 billion (2014-15 to 2018-19)[b]	To be eligible for funds, projects must demonstrate a clear net positive benefit and other criteria agreed under the National Partnership Agreement on Asset Recycling
Roads to Recovery Program	\$1.75 billion (2014-15 to 2017-18)[c]	Eligible local roads must appear on the National Building Program Roads to Recovery list
Community Development Grants Fund Program	\$304.2 million (2014-15 to 2016-17)	Projects assessed against three criteria: outcome; viability and sustainability; and the financial viability of the funding proponent
Black Spot Program[d]	\$440 million (2014-15 to 2017-18)	Projects have a cost–benefit ratio above 2 and are assessed to improve the safety of roads with a history of accidents
Nation Building Funds[e]	Project specific	To be eligible for funds, projects must satisfy a number of criteria established through legislation
One-off grants through other programs	Project specific	Project specific
South Australian Desalination plant	\$328 million	The funding was conditional on a minimum capacity of 100 gigalitres per year
Grafton Hospital upgrade	\$6 million	Payments were conditional on achievement of project milestones

[a] Australian Government contributions are as proposed in the 2014-15 Budget except for one-off grants made through other programs. [b] In the 2014-15 Budget, the Australian Government proposed to establish an Asset Recycling Fund (ARF) from 1 July 2014 which will be used to make payments to the States and Territories under the Infrastructure Growth Package. The ARF will commence from 1 July 2014 with an initial size of approximately \$5.9 billion with contributions of uncommitted funds currently in the Building Australia Fund (BAF) and the Education Investment Fund (EIF). The total funding from the Australian Government under the Asset Recycling Initiative for the first five years is \$5 billion. Establishment of the ARF will be subject to the passage of legislation through the Parliament. [c] Includes additional funding in 2015-16 from the ARF. [d] Includes additional funding in 2015-16 and 2016-17 from the ARF. [e] Includes the BAF, EIF and Health and Hospitals Fund.

Sources: Australian Government (2014c, 2014d, 2014g, 2014h); PC (2011a); SCFFR (2011).

By contrast, infrastructure specific grants can be conditional, with projects assessed against:

- 'soft' criteria, where funding is provided if the projects are deemed to meet the purpose or intent of a fund or are consistent with government policy

- legislated criteria, such as the Building Australia Fund, which includes specific governance arrangements as well as requirements for proposed projects to be supported by evidence and data on the expected costs and benefits (box 7.3).

Some participants raised issues relating to the way that the Australian Government currently distributes funding to the States and Territories. For example, the Victorian Government (sub. 81) pointed to the short-term nature of infrastructure funding, such as the (previous) AusLink program, which ran over the period 2004–09, and the Nation Building Program (2009–14). It suggested that the Australian Government needed to take a long-term view when funding nationally significant infrastructure.

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More broadly, the Victorian Government (sub. 81, p. 9) pointed to volatility and uncertainty in the amount of revenue it receives from the GST, driven by changes in total GST receipts, and the share allocated to Victoria. It suggested that 'given GST funds are a major component of Victoria's discretionary revenue pool, a reduction may prove to be a significant constraint to adequately funding infrastructure projects'. It also argued that differential treatment of Australian Government funding for national network roads compared to rail projects in calculating the GST distribution, favours investment in roads over rail.

The treatment of Australian Government payments for road and rail projects for the purpose of determining relativities for the distribution of GST is beyond the scope of this inquiry and is more appropriately considered as part of the Commonwealth Grants Commission's review process.

Box 7.3 **The Building Australia Fund and the Asset Recycling Fund**

The Building Australia Fund (BAF) is one of three Australian Government Nation Building Funds established on 1 January 2009. It provides funding for the development of infrastructure in the areas of transport, communications, energy and water. Eligible payments from the BAF may involve financial assistance grants, the acquisition of financial assets (such as shares) in a company involved in the creation or development of relevant infrastructure, and public private partnership payments. Funding applications are assessed by Infrastructure Australia which advises the relevant portfolio Minister if the project meets the evaluation criteria, as set out in a legislative instrument under the *Nation-building Funds Act 2008* (Cwlth). Projects are assessed based on the:

- extent to which projects address national infrastructure priorities
- extent to which proposals are well justified with evidence and data, including that proposals pass a cost–benefit analysis
- extent of efficiency and co-investment, including that projects should take account of relevant market structures and pricing mechanisms
- extent to which efficient planning and implementation has occurred, including that project risks have been analysed.

The portfolio Minister then prioritises the list of eligible projects, most of which are then considered during the annual budget process. Payments to the states and territories are channelled through the COAG Reform Fund within the Treasury portfolio.

In the 2014-15 Budget, the Australian Government announced its intention to discontinue the BAF at the end of 2014 (but meet commitments for outstanding payments previously approved under the Fund), and establish an Asset Recycling Fund (ARF) from 1 July 2014. As currently proposed, the ARF would provide funding and financial incentives to the States and Territories for investment in new productivity enhancing infrastructure with payments to be made through the COAG Reform Fund under various National Partnership Agreements. The investments of the ARF will be managed by the Future Fund Board of Guardians in accordance with an investment mandate to be issued by the Treasurer and Minister for Finance.

The National Partnership Agreement on Asset Recycling signed by the Australian, State and Territory Governments on 2 May 2014 requires that for infrastructure projects to be eligible for funding from the pool they must:

- demonstrate a clear net positive benefit
- enhance long-term productive capacity of the economy
- where possible, provide for enhanced private sector involvement in both the funding and financing of the infrastructure.

In addition, the Australian Government will also consider projects that meet long-term economic infrastructure priorities in regional economies.

Sources: Australian Government (2014c); COAG (2014); Department of Finance (2014).

Infrastructure funds

Some participants proposed various forms of 'infrastructure funds' (at the national, state or local level) as a means of improving the provision of public infrastructure. In particular, it has been argued that the establishment of an infrastructure fund could address problems with the availability and certainty of funding for infrastructure projects, and could also include governance arrangements which provide incentives for better project selection and more efficient delivery.

The term 'infrastructure fund' potentially captures a variety of models. Some involve funding dedicated to a specific-purpose fund within the public sector. This may or may not be accompanied by new rules, criteria and processes (including between levels of government) to determine the allocation of funds. Other models may involve the creation of a new entity to administer the funds and/or other forms of financial support. Such approaches are more akin to the 'infrastructure bank' model (chapter 6).

As part of the National Infrastructure Plan, IA proposed consolidation of Australian Government funding sources into a single national fund. It suggested this would improve the quality, efficiency and transparency of infrastructure spending by leading to a more robust prioritisation of projects, and a move away from a project-by-project view of infrastructure development (IA 2013a). This approach was supported by some inquiry participants (Australian Constructors Association, sub. 72; Australian Motoring Enthusiast Party, sub. DR149; Regional Australia Institute, sub. 92). The Victorian Government (sub. 81) suggested consideration of a dedicated national infrastructure fund for IA recommended projects (comprising a fixed annual component and supplementary component based on the Australian Government's annual budget capacity), pointing to the P3 Canada Fund as an example (box 7.4).

Some participants proposed that infrastructure funds should be created at the state level. Herbert Smith and Freehills (sub. 68) noted that a state government could establish a state-owned entity under its own legislation, which provides credit enhancement for debt instruments issued for major infrastructure projects. The fund could be overseen by an independent governing body which has a mandate to focus on projects accorded a particular status by IA. In its supplementary submission, it suggested an infrastructure fund could be used to provide initial seed funding for public infrastructure which would be withdrawn when the project achieves certain benchmarks considered necessary before it is suitable for stand-alone funding (Herbert Smith Freehills, sub. DR192).

The NSW Government (sub. DR171) indicated that Australian Government funding for infrastructure should be directed to a state-based infrastructure fund (such as Restart NSW) to encourage funding on a program rather than project-specific basis. In its view, payments should be provided using a formula linked to the project's contribution to the national economy, and would also be subject to the state meeting a series of National Infrastructure Governance Standards which could be developed and agreed by governments. Other participants proposed models for infrastructure funds based on 'City Deals' arrangements in the United Kingdom (box 7.4).

Box 7.4 **International examples of infrastructure funds**

The P3 Canada Fund

The P3 Canada fund was established in 2009 as a Federal Crown Corporation to encourage and improve project delivery. It is administered by a national body (PPP Canada) and provides funding support to public infrastructure projects in 15 eligible categories proposed by public authorities including provincial, territorial, municipal or regional governments. In assessing proposals, PPP Canada will give priority to sectors such as transportation, water/waste-water, solid waste disposal, and brownfield redevelopment. The P3 Canada Fund is a merit-based program. To meet the application criteria projects must:

- be well structured and deliver value for money
- demonstrate substantial risk transfer to the private sector
- establish public benefits
- promote jobs and economic growth.

The level, form and conditions of any funding support will vary depending on the needs of a given project. As at December 2013, the Fund had committed over $700 million to more than 15 PPP projects in Canada.

UK 'City Deals' agreements

City Deals are agreements between the UK Government and city governments based on a policy announcement by the UK Government in 2011. They involve transferring new powers to a city government in exchange for it taking greater responsibility to stimulate and support economic growth in its area.

The first wave of agreements have been reached with the eight largest cities outside London. The second wave involves a further 20 cities of which 16 agreements have been agreed to date. Each agreement is bespoke and reflects the different needs of individual places. However, they have typically included the establishment of an 'economic infrastructure fund' to pool multiple funding streams and business rate income into a single investment fund, leverage private sector capital and invest in local priorities (including infrastructure). The intention is for cities to create self-sustaining investment funds that will reduce dependence on central government grants.

Sources: UK Government (2012); PPP Canada (2014); Victorian Government (sub. 81).

The Bus Industry Confederation (sub. DR127) proposed the establishment of state-based land transport funds which receive revenue from users, value capture and government (federal, state and possibly local government). The fund would be managed by a separate board and would implement priorities that emerge from long-term state land use and transport plans. Some participants proposed the creation of infrastructure funds as a means of increasing the capacity of State and Local Governments to meet their infrastructure priorities (with accompanying governance reforms) (Australian Sustainable Build Environment Council, sub. DR164; Council of Mayors (SEQ), sub. DR119; Property Council of Australia, sub. DR131).

Commission's assessment

If the governance arrangements could be designed to avoid the pressure for competing political judgements, it is conceivable that the establishment of an infrastructure fund could, but need not, lead to improvements in project selection.[35]

However, the Commission considers that improving the full scope of project selection, design and development is the larger issue. Improved governance arrangements are not conditional on the establishment of an infrastructure fund. Indeed, many of the best practice governance reforms outlined in this report could (and so should) be implemented by jurisdictions without creation of an infrastructure fund and irrespective of the financing mechanism used for projects.

Moreover, the creation of some types of infrastructure funds could face similar risks that would be involved in the establishment of an infrastructure bank (chapter 6). Specifically, the ready availability of funding could create incentives to fund projects simply because they are on a current list – even though such projects are not necessarily those with the highest net benefits to the community, but rather represent available investment options at the time the fund is created. The insistence on shovel-ready projects may come at the cost of superior projects, which are properly assessed, well designed and implemented.

An infrastructure fund could also encourage rent-seeking behaviour by private sector proponents and risk crowding out private financing solutions. If specific eligibility criteria are set, project proponents have incentives to design projects that meet these rather than seek the best solution to the problem. This is not a theoretical concern. A preparedness on the part of the Australian Government to invest

[35] It should be noted that the concept of an infrastructure fund as discussed in this context is distinct from the road fund model proposed in chapter 8.

primarily in roads means the solutions to urban transport problems in a fiscally constrained environment will inevitably be roads oriented.

For these reasons, on balance, the Commission is not convinced that the establishment of an infrastructure fund is necessary nor desirable. The Commission's preferred model to improve governance and institutional arrangements is outlined later in this section.

The Australian Government has recently announced its intention to establish an Asset Recycling Fund (box 7.3), a form of infrastructure fund. If adopted, the governance and institutional arrangements to oversee management of this fund should be subject to the best practice principles and processes outlined in recommendation 7.1.

Imposing conditions on Australian Government funding and financing of public infrastructure

The Commission considers there is scope for the Australian Government to use its funding and approval roles to further strengthen the incentives for improved outcomes for the community in the provision of public infrastructure.

This view is largely supported by inquiry participants, some of which advocated greater conditions being imposed on Australian Government funding for infrastructure. For example, the Office of the Infrastructure Coordinator (sub. 78) suggested that the Commission explore options for explicitly tying Australian Government funding decisions to a process for rigorous project assessment to ensure investment in projects with the highest productivity benefits. In addition, Ergas (sub. 87) proposed an approach that would involve the Australian Government providing grants to the states on a formulaic basis, with funding made conditional on the adoption of corporatisation approaches and evaluation of delivery of infrastructure services.

In the draft report, the Commission proposed an approach to strengthen incentives for State and Territory Governments to provide infrastructure services more efficiently. This involved making Australian Government funding conditional on adherence to the set of best practice governance principles and policy processes outlined in this chapter (recommendation 7.1).

The purpose of such an approach is to facilitate better processes, decisions and ultimately, outcomes for the provision of public infrastructure. This approach is generally preferable to the Australian Government prescribing which projects should be undertaken by other levels of government. The relevant Australian

Government Ministers would be responsible for approving and issuing the criteria. Where existing standards and processes are reviewed and deemed to be clearly sufficient to meet improved planning and development, then no change would be required.

The best practice governance arrangements should apply equally to all levels of government, including the Australian Government, and irrespective of the funding or financing mechanism used. This means they would apply equally regardless of whether the Australian Government initiates a project itself (for example, the National Broadband Network), chooses to provide infrastructure-specific grants, establishes a national infrastructure fund, or provides other forms of assistance, such as loans and guarantees (chapter 6).

These governance arrangements should also apply to decision-making processes where the Australian Government has a role in granting project approval or setting the regulatory frameworks for approval with regulatory functions designated to a statutory authority (such as project assessments in the energy network for investment proposals above the $50 million investment threshold (recommendation 2.3)).

Consultation on the criteria that are to apply to the provision of Australian Government funding for infrastructure should be undertaken with local government and the States and Territories.

The proposed approach would require IA to scrutinise the use of these criteria in state and territory processes for project selection and delivery. To apply effective scrutiny, its independent right to publish should be further strengthened (as discussed above). Further, IA (and its state equivalents) could usefully examine alternative infrastructure options not proposed by governments. While there have been some poor projects that have proceeded, there are also many good potential projects that never proceed beyond the project selection stage.

Furthermore, the allocation of Australian Government funds (as well as the provision of loans and government guarantees) should be subject to normal budget reporting rules and accounting standards. A list of infrastructure projects which qualify under this process could also be made publicly available and regularly updated.

Participants' views

There was broad support from inquiry participants for the proposed conditional framework (for example Australian Constructors Association, sub. DR169;

Australian Trucking Association, sub. DR176; Business SA, sub. DR136; CME, sub. DR123; Consult Australia, sub. DR168; Engineers Australia sub. DR123; Institute of Value Management, sub. DR125; Local Government Infrastructure Services, sub. DR155). Some participants indicated they while they supported this type of conditional framework in principle, the Commission needed to go further to ensure the reforms were properly implemented. For example, while the Property Council of Australia (sub. DR131) supported the basic proposals and principles in the draft report, it considered that it lacked a cohesive method for hardwiring proposed reforms into government funding mechanisms. To address this, it suggested that an adapted version of the UK City Deals model could assist to tie the recommendations into a consistent and implementable reform package, similar to the approach used under National Competition Policy.

Similarly, Infrastructure Partnerships Australia (sub. DR186) suggested that the Commission should further develop the draft report's recommendation regarding conditional payments. This would include a consideration of the likely institutional architecture of such an arrangement, indicating the reform benchmarks on which payments would be based and identifying a potential lead agency to progress the funding program.

Other participants raised concerns with a conditional funding framework. For example, the Australian Local Government Association (sub. DR137) noted concerns with a proposal where grants would be made conditional on procurement or selection processes. Local Government Infrastructure Services (sub. DR155) commented that the capacity of local governments to determine value for money and project viability varies across local governments and in many cases is nonexistent. Small to medium-sized local governments in particular often lack in-house specialists or technical expertise to prepare an appropriate business case for proposed projects.

Implementation issues

Important implementation issues will arise with the nature of comprehensive reform of this kind. Local government capacity will be one such issue. Care should be taken to avoid simply imposing excessive costs on a level of government that does not have adequate resources to deal with them. Similarly, any regulatory arrangement that requires the provision of information by private infrastructure providers as a condition of Australian Government approval should be carefully assessed against the benefits of such information.

Although it is important to avoid the imposition of excessive or unnecessary regulation, the adoption of a less comprehensive level of reform due to resourcing issues would reduce the potential gains that can be achieved. Relevant skills can and should be shared within jurisdictions and between levels of government to realise the full scale of benefits associated with eliminating low quality or poor infrastructure investment.

RECOMMENDATION 7.3

Australian Government funding or other forms of financial assistance (including incentive payments under Commonwealth–State agreements) for public infrastructure that is provided to State and Territory and Local Governments should be conditional on the adoption of the governance arrangements outlined in recommendation 7.1.

This assistance should only be provided where there is evidence of a demonstrable net public benefit from the project that would otherwise not be obtainable without Australian Government support.

The Australian Government should support the incorporation of the framework in Recommendation 7.1 for project assessment in the energy network investment framework.

Consultation on the criteria to be applied and any potential implementation issues associated with such an approach should be undertaken with the State and Territory and Local Governments.

The adoption of this proposal as well as the other reforms outlined in this report, are expected to improve the processes and outcomes relating to the selection of public infrastructure projects. They could also be expected to lead to improvements in the way public infrastructure is delivered.

However, for these proposed reforms to have their intended effect, governments at all levels must commit to and support them, even when that leads to project selection decisions that are in the public interest but not politically expedient. The proof of that commitment lies in rejecting projects that have obvious political appeal yet fail a transparent cost–benefit test and in choosing projects which may not be as popular but offer long-term net benefits to the community.

An implementation plan for the adoption of the recommendations as a ‘reform package’ is outlined in chapter 16.

Establishing a project pipeline

Many participants have emphasised the importance of establishing a long-term 'pipeline' of infrastructure projects to create more opportunities and stability for long-term private investors, including superannuation funds (for example, Association of Superannuation Funds Australia, sub. DR139; Australasian Railways Association, sub. DR178; Australian Motoring Enthusiast Party, sub. DR149; Cbus, sub. 67; CME, sub. DR132; Department of Infrastructure and Regional Development, sub. 64). Some participants pointed to the potential benefits from reducing the intermittency of projects, which may cause peaks and troughs in construction activity, with implications for pushing up wages and the prices of other scarce inputs (Engineers Australia, sub. DR123).

Better management and coordination of projects has also been recommended by several stakeholders to facilitate better planning of workforce demand and improve incentives for training (chapter 13). In this regard, the University of New South Wales commented:

> Certainty of project pipelines is critical for forward planning of resources, for investments in training, technologies and innovations and to enable project teams to refine and optimise efficiency and productivity over time. Sustained investment programs also encourage vertical integration which has been shown overseas to produce lower infrastructure costs by reducing transaction costs in the supply chain. (sub. 44, p. 3)

The Infrastructure Finance Working Group (2012) considered that the existence of a detailed pipeline of infrastructure projects reflecting the firm forward intentions of governments would provide potential investors with project certainty and assist stakeholders in making forward planning commitments.

The Australian Government has sought to develop measures that contribute to an effective pipeline of projects. The National Infrastructure Construction Schedule (NICS) is a collaborative effort between the Australian, State and Territory and Local Governments to provide information on all infrastructure projects greater than $50 million that are procured by the general government sector. It also includes projects with opportunities to bid on contracts estimated to be worth more than $25 million (Australian Government 2014e).

The NICS is intended to identify opportunities for the private sector to bid on major infrastructure projects in advance of the announcement of the project. However, the BCA (sub. 39) commented that the NICS does not provide an economywide forward pipeline of investments in economic infrastructure because it only lists projects to be tendered by governments. Like all such lists, it reflects only the set of projects that are developed under current processes.

As part of its reporting to the Australian Government, IA outlines a priority list of projects. IA has already commenced an infrastructure audit and is developing a 15 year view on nationally significant infrastructure projects which will be revised every five years (Office of the Infrastructure Coordinator, sub. DR185). The Civil Contractors Federation was supportive of the Australian Government's proposals for IA to develop a 15-year infrastructure plan and suggested that State and Territory Governments should do the same:

> Industry relies on infrastructure plans to provide it with a clear picture of the project pipeline which in turn drives how it manages various aspects of their businesses such as workforce, resources, procurement and the like … There may be other benefits to providing well-defined planning for infrastructure as it may attract known private sector investment interest and would alleviate some need for government funding. (sub. 34, p. 6)

In the draft report, the Commission stated its view that, regardless of current arrangements continuing (including the NICS), the adoption of its overall package of proposed reforms should lead naturally to the disclosure of public information which is sufficient to provide a reasonable indication of future public infrastructure priorities. This would constitute an effective pipeline, with the capacity to regularly update.

There are different views from participants, and more generally in the wider public policy discourse, about what measures constitute an effective project 'pipeline' for public infrastructure. Some participants commented that while the Commission's proposed reforms would go some way towards improving the pipeline of future projects, they are insufficient to create an effective pipeline (Cbus trans., pp. 34–36; CME, sub. DR132; Engineers Australia, sub. DR123).

Other participants noted that what is required is not necessarily a more elaborate project list, but for the Australian Government in particular to play a more substantial coordinating role in providing a framework to encourage a more effective sequencing of projects within and across jurisdictions (Cbus trans., pp. 34-36; CME, sub. DR123). In this regard, the CME commented:

> Long term, coordinated planning around infrastructure requirements can help avoid duplication and delays, ensuring state infrastructure needs are met at efficient cost. In Western Australia there are recent advances in the state's infrastructure related planning … however, there still remains a shortage of detailed planning across asset classes. (sub. DR132, p. 6)

The Association of Superannuation Funds of Australia (sub. DR139) commented that it was not seeking a project list but rather an indication of whether governments will seek private investment in projects, particularly over boom-bust periods according to the position of budgets. It acknowledged the need for flexibility in the

actual list of projects that are brought forward for construction. However, it emphasised that a consistent approach to seeking private investment would provide superannuation funds with greater visibility of potential investments, greater competitive tension among bidding teams and address the tendency for government to seek projects with short-term political appeal.

The BCA (sub. DR197) commented that the outcome from the Commission's proposed approach should be the provision of high quality projects for the private sector to invest in and deliver efficiently on behalf of the community. However, it argued that there remains merit in publishing a rolling pipeline to provide industry with the certainty to invest and as better way to ensure continuity of investment plans across the political cycle.

Some participants noted potential difficulties and risks associated with seeking to publish project pipelines (Edwards, sub. DR181; Sine Iactura, sub. DR153).

The Commission received limited feedback on the appropriate organisational framework to collect and publish information about a pipeline of projects, and the extent to which private organisations should also provide information. The Office of the Infrastructure Coordinator (sub. DR185) indicated that IA is well-positioned to undertake this function given its current activities. The Australian Construction Industry Forum (sub. DR183) noted that the Australasian Procurement and Construction Council has previously collected project information primarily from agencies delivering public sector non-residential projects. It is currently working with the Australian Government to investigate the potential for a similar pipeline for infrastructure including state and territory agency projects.

Commission's assessment

Effective infrastructure planning requires governments to overhaul their infrastructure development and assessment processes. Greater transparency of information about governments' forward-looking infrastructure investment intentions would provide an improved opportunity for innovation and confidence in planning to both private investors and the users of infrastructure. This could also potentially moderate incentives to make decisions based on short-term political considerations.

The adoption of the proposed reforms in this report will significantly improve the disclosure of public information about future projects. Governments could choose to regularly update and publish a list of priority projects. However, this should be created by the continuous publication of well-analysed project proposals at all levels of government. The information disclosed through these processes should enable

both private financiers and public funders to assess their potential roles well in advance of governments announcing the commencement of a tender process.

Such a pipeline would have the capacity to be analysed not only by the public for whom projects are being considered, but also for the private sector to assess the investment intentions of agencies and governments. This would represent a publicly transparent flow of opportunities which is likely to be superior to any selected list based on the political priorities of the government of the day. To the extent that a partial list substitutes for effective processes under the reforms, there will be forgone opportunities to improve the efficiency of infrastructure provision.

Once the reforms have been implemented and embedded, a review should be conducted to determine if there is further scope to improve the project pipeline.

8 Governance and institutional reform in the roads sector

Key points

- Current governance, taxation and institutional arrangements for the provision and funding of roads are presenting challenges for coherent long-term planning and investment in road infrastructure, and are ultimately unsustainable.
  - There is no direct link from road-related revenue to road-related expenditure. This makes it difficult to determine road users' preferences and willingness to pay for road infrastructure services.
  - Investment in roads is subject to political pressures arising from annual budget processes and election cycles.
  - Decisions are often based on inadequate information and assessment of the costs and benefits of road projects.
- If investment in roads is to be made sustainable with the expected high level of future urban development in Australia, there is a pressing need to commence the task of moving toward alternative institutional models in the roads sector.
- The adoption of a well-designed road fund model or a corporatised public road agency model is paramount to improving outcomes in the funding and provision of roads. The new model should provide the opportunity and incentives to consider future direct road user charges, which would facilitate more effective asset utilisation and more rigorous assessment of new investments.
- It is imperative that any institutional model adopted includes the direct involvement of road users and a transparent process of community consultation. This will help to ensure that road investments are being directed to areas that provide the highest value to the community, and also help to facilitate community acceptance of more direct road user charging schemes.
- The road reform process is likely to be a long journey, requiring effective coordination and significant commitment and effort from all levels of government, to build public support. This is similar to the long process that built bipartisan support for trade liberalisation. While complex, the reform offers substantial benefits to the Australian community and road users.
- The first step in the reform process should be the establishment of road funds by State and Territory Governments, and by aggregations of local governments. The Australian Government should be primarily focused on providing strong practical support for jurisdictional reform, including by offering scope for redirection of resources to the new road funds.
- The success or failure of road funds will inform the case for further transition over time, potentially to a corporatised public road agency model.

This chapter outlines the Commission's reforms of the governance and institutional arrangements for the funding and provision of roads. Specifically, this chapter considers:

- the scope for institutional and funding reform for roads (section 8.1)
- options for improving governance and institutional arrangements in the roads sector (section 8.2)
- which model can most effectively facilitate improvements in road provision and charging (section 8.3).

The ultimate objective of the reforms in this chapter is to improve the wellbeing of the community by better allocating resources to roads. This will be best achieved through improvements in the investment, operation, maintenance and funding of roads, and a transition to more comprehensive direct road user charging arrangements over the long term (where this is justified on cost–benefit grounds).

Reform of direct road user charging is not a prerequisite for the adoption of the governance and institutional arrangements outlined in this chapter. Rather, effective governance and institutional reform could be expected to provide both the opportunity and knowledge necessary to implement improvements in road charging and funding. A key component of any institutional reform for roads is an arrangement that directly involves road users, as well as a transparent process of community consultation and provision of information.

8.1 Scope for institutional and funding reform for roads

Expenditure on roads is a substantial part of government infrastructure provision. Indeed, it is the single largest infrastructure expenditure item under control of the three levels of government (chapter 1). Yet it has a weak pricing and funding structure, with funding decisions often based on inadequate information and assessment of the costs and benefits of road projects (chapter 2).

Consumer involvement in the provision of roads is also minimal, and instead government departments and arbitrary ministerial decision-making largely determine supply. Taxes (for example, fuel excise), charges (for example, registration fees) and government grants comprise the bulk of funding sources. Recent toll road experience has shown the importance of thorough knowledge of consumer willingness to pay, to guide the expenditure of funds on road infrastructure services.

Currently, total revenue (funding) collected from road-related taxes and charges arguably approximately matches total expenditure on roads — although fuel excise has been lagging well behind growth in road use and the unit cost of building and maintaining roads (chapter 4). However, there is no mechanism to directly allocate road-related revenues to road investments that are preferred by users. There is also a mismatch between road-related revenues collected by different levels of government and their expenditure responsibilities. Road revenue is directed primarily to consolidated revenue rather than to road agencies, and in ways that do not provide a clear incentive to supply services that are valued by users. Hence, road-related taxes and charges do not provide market signals to users about the costs of provision, or to suppliers about where road investments are warranted (chapter 4).

Over the medium to long term there is a good prospect for reform of road funding and charging based on in-vehicle technology and improvements to institutional structures, to link more directly the provision of roads with road users' preferences and willingness to pay. Reform of institutional and funding arrangements would constitute an important mechanism to implement the reforms set out earlier in this report specifically for road infrastructure.

8.2 Options for improving governance and institutional arrangements in the roads sector

Improved road provision and funding outcomes (box 8.1) can be achieved with effective governance and institutional arrangements that better connect road demand and supply, particularly through the facilitation of greater capacity to charge users directly for road use.

Although the institutional models discussed below involve government (or a government agency) as the central element, there is a strong role and opportunity for private sector involvement in the delivery (design, build, operation) and financing of road infrastructure. Chapters 3 and 12 discuss the various models of private sector involvement in infrastructure delivery, such as traditional design and construct models and public private partnerships. There is also a strong role for road users to be directly involved in decision making around road funding and provision.

Institutional models for road provision

There are a range of institutional models that could be used to improve outcomes in the provision and funding of road infrastructure services. Indeed, a number of

institutional models have been applied or considered in other countries. For example, New Zealand has adopted a road fund approach. The OECD/ITF (2013) has also suggested that a regulated asset base approach could be used in the roads sector. Some countries, including Austria and the United Kingdom, have proposed or established commercial entities with responsibility for managing parts of their road networks.

A number of inquiry participants also proposed alternative institutional arrangements for roads that treat the road pricing, operation, maintenance and investment tasks in a more integrated way. For example, Smart Infrastructure Facility suggested that:

> There appears considerable scope to improve the overall management of public infrastructure assets by treating them in a more integrated way … Adoption of a corporatised framework to manage public assets has the potential to yield major governance improvements and promote better allocative decision making (sub. 94, p. 9).

Similarly, Ergas (sub. 87) argued that road agencies should be corporatised on a commercial basis. He also suggested that a reasonable degree of integration of responsibility for operating, pricing and investment would be required, noting that such an approach:

> … meant that you could use the price system not merely to allocate the existing road surface but also to inform management decisions and to inform investment decisions through financial constraints but also by signalling user demand. (Ergas, trans., p. 239)

Box 8.1 **The road provision and funding task**

The provision and funding of road infrastructure can be considered in terms of the following key road-related tasks:

- setting overall road-related outcomes
- undertaking project appraisals
- deciding on the aggregate level of expenditure on road provision
- deciding how that expenditure is to be allocated between different projects — new construction, and rehabilitation and maintenance of existing roads
- supervising project delivery to ensure decisions have been implemented efficiently
- charging for the use of roads to achieve more efficient use of the infrastructure

The way these tasks are undertaken can differ considerably, depending on:

- the institution responsible for undertaking the task
- accountability for outcomes achieved
- how performance is monitored.

Source: PC (2006b).

More broadly, the Office of the Infrastructure Coordinator suggested that:

> … road use and infrastructure should be brought into line, as far as possible and as quickly as possible with the principles of use and the provision of other infrastructure. (sub. DR185, p. 1)

The Commission has previously identified a number of institutional models that could help achieve a more economically sustainable focus on road provision and management, and improve investment outcomes by making expenditure decisions more responsive to the needs of road users (PC 2006b).

There are four broad institutional models that are currently used, or have the potential to be used, in the roads sector.

- *Departmental model* — a model of project selection and management and allocation of road funding, with earmarking of road-related taxes and charges used to fully fund roads on an economically sustainable basis.
- *Road fund model* — project selection, and management and allocation of road funding undertaken by a separate dedicated entity that operates at arm's length from government on an economically sustainable basis.
- *Corporatised public road agency model* — public road authorities (integrating all tasks relating to road funding and provision) are run on a more economically sustainable basis using both funding from governments and revenue raised from direct charges on road users, with those charges and road service standards overseen by a regulator.
- *Private provision model* — private ownership and provision of roads (such as the road concession model).

Variations and hybrids of these models are also possible. For example, the road fund model could also include the tasks of funding and provision of infrastructure services in the one entity, in which case it would have some similarities to the corporatised public road agency model. The main governance and institutional features and strengths and limitations of these broad approaches are discussed below.

Departmental model of road provision with hypothecation

Under the current departmental model of road provision, governments typically make decisions about the aggregate level of funds to be invested in road infrastructure, and the allocation of funds to specific areas or large projects. Once decisions about project selection have been made, delivery of approved projects is the responsibility of road agencies and authorities, which are primarily funded from

consolidated revenue appropriated through the annual budget process. (In some jurisdictions, such as Victoria, New South Wales and Western Australia, state road agencies are set up as separate statutory bodies.)

Thus, rather than operating like a commercial entity, road authorities are essentially managed and funded as government departments. Further, the extent of funding that is allocated to roads may be determined by the priority that governments place on roads relative to other government programs. This may be revisited at each annual budget and election cycle. As a result, investment in roads is often subject to political pressures. This may mean that road funding bears little direct relationship to the preferences of road users or their willingness to pay. This can contribute to funding and investment uncertainty for road agencies, and limit their ability to design and manage coherent long-term road investment programs and to maintain and improve utilisation of existing road networks.

These existing institutional arrangements are unlikely to be the most effective in meeting the future demand and supply challenges for roads. Significant population growth is expected by 2060, particularly in Australia's capital cities (PC 2013a). Thus, if road investment is to be sustainable with future urban development, there is a pressing need to commence the task of moving towards alternative institutional models in the roads sector.

Hypothecation of road revenues

A possible feature of the departmental model of road provision that can reduce uncertainty about the availability of funding is the hypothecation of revenue collected from road-related tax bases, including fuel taxes and vehicle registration charges, and direct road user charges if these are levied (chapter 4). This requires revenue from those sources to be legislatively earmarked or effectively committed to partially or fully fund road investment and maintenance expenditure.

Some participants supported hypothecation of road-related taxes and charges, either generally to improve the efficiency of road investments, or to support the case for road pricing reform. The Local Government Association of Queensland suggested:

> As an intermediate step and process building block toward applying this [road pricing reforms for heavy vehicles] to light/private vehicles, LGAQ recommends that all current taxes, charges, excises, etc. collected from road users ostensibly for roads be hypothecated directly to road infrastructure managers … Hypothecation is a key element to improving the connection between demand, costs, revenues and provision … (sub. DR143, p. 3)

When discussing the principles that should be incorporated in the design of a road pricing scheme, the NSW Business Chamber said that:

> Changes to road charging would need to occur in concert with changes to road funding models, including hypothecation of revenue, to ensure that more efficient investment in road infrastructure occurs. (sub. DR148, p. 4)

The Transport Reform Network (trans., p. 7) also advocated hypothecation of user charges to road investments and maintenance expenditure.

In itself, hypothecation is insufficient to bring about improvements in road expenditure decisions. Simply earmarking revenues from road-related taxes and charges offers no guarantee that road investments that are most highly valued by users (including options that do not include major civil works, such as safety or technology improvements) will be considered. Further, hypothecation is likely to have a limited effect on efficient road expenditure if the revenue is derived from non road-related sources, and as such, expenditure bears little relationship to road taxes and charges.

Hypothecation could be of benefit, however, in demonstrating to road users that reforms (particularly road charging reforms) are not simply aimed at reducing infrastructure funding levels or increasing government revenues, but are instead aimed at more efficiently and effectively allocating road revenues.

Ultimately, the benefits of hypothecation depend on the institutional and governance arrangements that support them. An inherent benefit of the models discussed in the following sections is that they offer scope for hypothecated funding arrangements to be included as part of an institutional and governance model that promotes more efficient resource allocation. That is, one that involves a shared commitment between road users and road funders.

The road fund model

The road fund model is distinct from the departmental approach in that it includes institutional arrangements that involve devolution of responsibility for project selection and management of road infrastructure funding to a separate entity.

The key features of this approach are discussed below.

Allocation and management of revenue sources

Under a road fund model, revenue from road-related sources — including direct user charges, where these are used, and other road-related taxes and charges

(chapter 4) — would be allocated to a separate dedicated fund, rather than to consolidated revenue. Revenues could be hypothecated or potentially collected directly by the road fund entity.

The amount of revenue would need to be stable and sufficient to meet the needs of the expenditure program, including funding to cover community service obligations (CSOs) (discussed later). The road expenditure program may be multi–year and would relate to new road investments, as well as to the maintenance and upgrade of the existing road network.

However, the amount of revenue would vary over time (for example, via increases or decreases to road-related tax rates and user charges) to meet the requirements of the road program, in line with the road fund's process of assessment and allocation of investment funds.

The expenditure program would be determined by selecting road projects yielding the highest net benefits to the community, as well as taking into account the government's preferences for ensuring minimum service outcomes to all sections of the community. Specific performance characteristics of priority transport corridors or networks could be used to inform allocation decisions, should the government and the managers of the new road fund choose to develop these. Private sector providers (including private finance) could also generate proposals that meet these performance requirements.

The revenue sources of the road fund should not, for reasons outlined in chapter 7, be viewed as money that must be spent. A 'honey pot' could result in over investment in roads or investment in road projects that do not generate the highest net benefits to the community from all possible projects. Importantly, expenditures from the fund would vary each year as many infrastructure projects are inherently lumpy. The Government should resist the temptation to view a relatively large amount in the fund as an untapped source of consolidated revenue during periods of weak economic conditions.

Greater institutional autonomy and accountability

The road fund model involves an organisational structure that operates at arm's length from government with a chosen entity (the road fund) responsible for managing the allocation of revenues from the fund. The organisational structure could take a number of forms. For example, it could involve one of the options below:

- judgment and decision-making by the Minister and board — an apolitical board with the power to select preferred investments, comprised of members (in

particular, road user representatives) with demonstrated expertise in transport, finance and economic assessment. Selection of board members should be based on a public process, preferably independent of the infrastructure service delivery portfolio. The relevant portfolio Minister would have the power to overrule the board, but would do so transparently via a published ministerial direction (as occurs with other infrastructure entities, such as in the water sector). If the Minister does not publish such a ministerial direction he or she would be deemed to have accepted the board's investment judgments.

- advice — an advisory panel, with the same characteristics as a board (as above) but with the role of recommending investment projects to the Minister (rather than selecting preferred investments). Again, a transparent process that directly involves road users would be used. Ministerial judgments that differed from the panel's recommendations would not require a formal direction, but would involve a process of publishing both the advisory report and the Minister's decision.

Review of the strength of the case for investments is an important feature of any governance and organisational arrangement adopted for the road fund. Review should be undertaken by a separate entity, such as an Auditor-General or Infrastructure Australia, to ensure regular scrutiny of the quality of planning and assessments is achieved.

The road fund would allocate revenues to projects (including for the upgrade and maintenance of existing roads) according to assessment criteria that seek to provide the highest net benefits to the community, as well as achieve other objectives, such as equity of access and road safety. There would also be public disclosure of the analysis used by the road fund to select the investment program using these criteria.

Under a road fund approach, government would play an essential role by setting the strategic focus, key decision-making parameters and specific outputs and outcomes it requires from the road fund (including CSOs). Depending on the organisational structure of the road fund, these arrangements and parameters could be specified in legislation, statements of intent, or performance agreements. Consequently, a road fund would (to different degrees) be directly publicly accountable for meeting these outcomes, with performance potentially monitored through annual disclosure and reporting requirements.

The road fund model can be viewed as a move toward the establishment of clear governance arrangements that are focused on incorporating the interests of road users in the process of allocating road funding. It could achieve more economically sustainable management of the road system, including utilisation of existing road infrastructure. This would be a proxy for the relationship that exists where there is

direct road user charging. The model is not intended to replace ministerial responsibility and judgment with expert opinion. (For example, the Australian Trucking Association (sub. 176) raised concerns about removing political oversight and prerogative through a road fund overseen by non-elected officials.) Rather, in the absence of direct road user charging (which directly provides a signal of road user preferences), the intention is to enable road users to express a preference to the road fund for the allocation of road revenues to particular investments.

Thus, a dedicated road fund entity is distinct from the concept of a general infrastructure fund, such as the Building Australia Fund (chapter 7). Although the road fund has access to a revenue source it would not be under pressure to allocate all available funds. The road fund model aims to improve the allocation of road revenues via greater transparency and input from road users. Ministers would still have the discretion to make allocation decisions and would ultimately be accountable for the decisions they make (either to accept the decisions of the fund or override the decisions of the fund).

The separation of the road funding and road provider tasks

The road fund approach essentially separates the tasks of road funder and road provider (figure 8.1), although as discussed in the following section, an alternative model of a road fund could integrate these tasks. The road fund would not undertake detailed investment appraisal or delivery of road projects. These tasks would be the responsibility of road agencies and local governments, who would submit funding proposals (supported by cost–benefit analysis) to the road fund. It would also be of value for the road fund to consider unsolicited project proposals from the private sector (appendix J). The road fund would have the autonomy to select projects that provide the highest net benefits to the community and would, along with the government, monitor and assess investment outcomes.

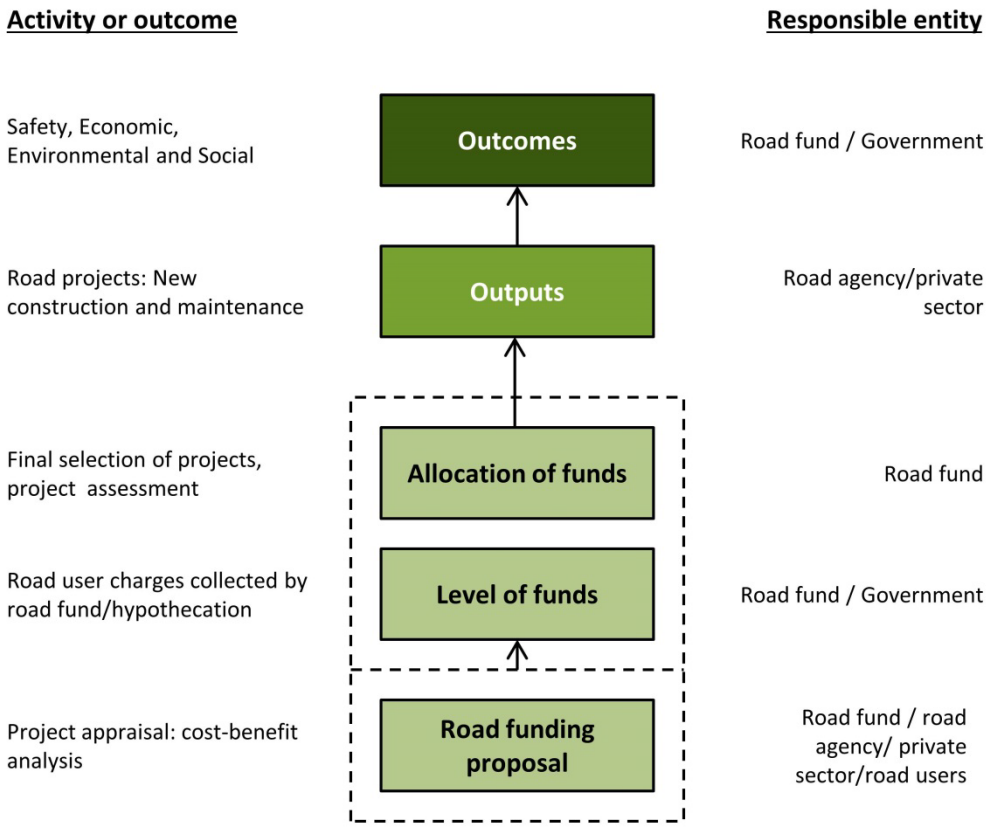
The actual implementation of road projects would not necessarily be undertaken by road agencies or local governments. Road agencies and local governments may choose to involve the private sector in the delivery of road infrastructure services through contractual arrangements.

Depending on the model used, it may also be essential for the relevant government to provide the road fund with revenue sources (or guarantees) if there are to be long-term contractual arrangements between the road fund and the private sector (for example, payments to a road operator for the construction and long-term operation of a major road using a public private partnership).

The integration of the road funding and road provider tasks

An alternative road fund arrangement could involve one entity that is responsible for both the task of road funding and provision, at least for some elements of the road network, such as local, state or national roads. An example of this is the approach currently in operation in New Zealand (box 8.2).

Figure 8.1 **Road fund model institutional arrangements**



Source: Adapted from PC (2006b).

The New Zealand road fund approach initially involved one entity responsible for the management and allocation of road funding with separate road providers responsible for operating and planning the road network. A single entity that is responsible for road funding and provision for the state highway system was created in 2008 in response to issues relating to governance and funding, including lack of clarity around the role of some agencies and inconsistent planning and funding policies.

Box 8.2 **New Zealand road funding arrangements**

Prior to 2008, Land Transport New Zealand was responsible for land transport funding and safety in New Zealand. Its statutory functions involved determining whether particular activities should be included in the National Land Transport Program and approving funds and procurement for land transport activities. The principal road provider, Transit New Zealand, was the government entity responsible for operating and planning the New Zealand state highway network, with the rest of New Zealand's roads controlled by local authorities.

Arrangements post–2008

In 2007, a review by the New Zealand State Services Commission recommended that Land Transport New Zealand should be merged with Transit New Zealand as:

- the benefits of integration would outweigh those of retaining separately focused entities
- one Crown entity would be required to consider all transport modes and activities and ensure that appropriate tradeoffs are made
- one Crown entity would be accountable to the Minister
- one Crown entity would be required to focus on cost-effective delivery.

Subsequently, the two former entities were merged in July 2008 to form the New Zealand Transport Agency (NZTA). The statutory functions of the NZTA include:

- investing in land transport
- managing the state highway system, including planning, funding, design, supervision, construction and maintenance operations
- managing funding of the land transport system, including auditing the performance of organisations receiving land transport funding.

The NZTA Board is responsible for decisions relating to investment of funds for transport from the National Land Transport Fund, with funds sourced from road users through fuel excise, charges on diesel and heavy vehicles (road user charges), and vehicle registration and licensing fees. NZTA must give effect to the government policy statement on land transport funding. However, the Board has independent decision-making responsibilities with respect to the specific activities in which it invests. The agency's performance is monitored and evaluated by the government through a statement of service performance and a requirement to report annually.

Sources: NZ Government (2007, 2012).

A potential benefit of integrating funding and provision into one entity is that it may better enable road investment decisions to be considered by users and providers on a portfolio-wide basis. In this case, the road agency would be encouraged to consider options and needs across the entire road network it is responsible for. In doing so, the road fund and users may better consider tradeoffs between large-scale projects and other potentially less costly and smaller options, including making more efficient use of existing roads (such as using advanced traffic management

systems). A single entity may also be able to more easily facilitate a further transition over time to reformed road user charging and funding arrangements. The integration of funding and provision into a single entity is also a key feature of the corporatised public road agency model (discussed later).

Advantages and limitations of the road fund model

There are some important advantages of the road fund model. First, it facilitates independence of the task of project selection in a way that is road user oriented, with funding potentially separate from a government's annual budget process and election cycles. In effect, it provides a more direct link to the preferences of road users and the community. This would lead to improvements in the allocation of funds. A road fund that is fully funded by road users can also provide an opportunity to further integrate road user charges, and investment and maintenance expenditure. This could be expected to enable longer-term planning and improve decision making. In the future, road funds may be able to operate in the same way as water and electricity companies by varying revenue needs (and influencing the level of user charges) and/or borrowing (against expected revenues) to finance economically justified road projects.

Consult Australia (sub. DR168) expressed strong support for a road fund. However, it also proposed that revenue generated from a user pays model be hypothecated to transport infrastructure in the broadest sense, and not be restricted to roads. Financial-Architects Asia (sub. DR207) also suggested that a fund be established that covered rail as well as road transport. On the other hand, the Australian Trucking Association (sub. DR176) did not support user charges in one transport mode being redirected to support other modes, such as truck charges being used to fund rail developments.

As the objective of the reform process is to improve the allocation of resources, revenue raised from road users for the purposes of improving road transport should be allocated accordingly. Redirection of revenues to other transport modes, such as rail, would weaken the allocative intent of linking road user payments to road user preferences.

A further advantage of the road fund model is that tradeoffs and project allocations would be subject to wider scrutiny, strengthening the financial discipline on investment and expenditure decisions and leading to improved road services. Greater visibility of the amount spent on roads and the level of services provided may also help to improve community acceptance of direct road user charges.

There are, however, potential limitations of the road fund model. The road fund approach is essentially a strengthened form of linking allocation decisions to road revenues through hypothecation and greater input from road users. Consequently, some limitations that apply to the departmental approach with hypothecation could also apply to the road fund model. The reform will be at its weakest where:

- the relevant Minister retains complete control over the level or allocation of revenues the fund receives
- revenues are redirected from the fund to other uses
- revenues received by the road fund bear little relationship to the road taxes or charges levied on road users.

Even if a substantial component of the fund's revenues are in future derived from direct road user charging, inefficiencies could arise if the charges are inappropriately determined. At that stage of reform, regulatory involvement in overseeing charging arrangements may be inevitable.

Another potential limitation of the road fund approach could be a perception that its focus on economic sustainability (represented by the entity charged with responsibility for the fund) may not adequately address equity obligations. Such potential issues point to the need for clearly specified CSOs that are fully funded, rigorous and transparent project appraisal processes, effective road user representation, and public disclosure of the road fund's activities to ensure accountability of investment decisions and outcomes.

Potential implementation issues

Implementation of the road fund approach could be adopted at the national level, the state and territory level, or at the regional (local government level) (discussed in the following section). Deciding on the level at which a road fund should be established raises a number of issues, including: inter-jurisdictional issues related to the sources of revenue the road fund receives; what parts of the road network the fund would cover; how road charges would be set; and the method for allocating funds to road projects.

For example, if all revenues are allocated to a national fund for all roads, a national road funding mechanism would be necessary to allocate funds to various state, territory and local road providers. The mechanism would need to detail agreed funding arrangements with state and local governments and the procedures under which they manage their respective road funding shares. On its own, a national approach for allocating road revenues is unlikely to be the most effective in

improving outcomes for the community. As discussed below, the greatest scope for reform is likely to lie at the State and Territory and Local Government levels.

Jurisdictional road funds are more consistent with the principle of subsidiarity — that responsibility for a particular function should reside with the lowest level of government competent to deal with the issue. They would also be consistent with current roles and responsibilities for roads of each level of government. This is particularly important if a road fund that integrates the tasks of road funding *and* provision is established.

Infrastructure Partnerships Australia (trans., p. 207) suggested that any institutional model for the funding and pricing of roads would likely need to be at the state level. The Western Australian Local Government Association also expressed a preference for a decentralised, rather than national, regulatory and investment structure for road funding models:

> The Association believes that regulation and investment coordination at the state level should be preferred to a national approach because of the complexity and jurisdiction based nature of the national road network. This is particularly relevant to WA's roads, which could almost be considered a network in itself. (sub. DR154, p. 4)

The Business Council of Australia (trans., p. 341) questioned how a road fund would operate on a national basis and how funds would be allocated. It pointed to competition between states (similar to that which has arisen in relation to the distribution of GST revenue) as a potential issue with a national approach.

On the other hand, the Transport Reform Network (trans., p. 10) expressed a preference for a national approach. However, it also pointed to a number of implementation issues, and suggested that it may be more pragmatic to start with state-based trials. These issues included, the time required to achieve national reform, and inequities in funding of local government roads and state roads.

In the Commission's view, local and State and Territory Government road funds are likely to be the most effective, because they will tend to be better informed about local conditions and needs than a national entity. Moreover, they could largely adopt existing responsibilities for roads and enable the road reform effort to progress without the longer timeframes involved in developing a national approach. However, as noted later, some coordination between jurisdictions is likely to be necessary and desirable. The lessons learned from road funds adopted by jurisdictions that choose to move first could inform the design and implementation of road funds later adopted by other jurisdictions.

The method of allocating revenues from road funds

Two main approaches could be used to allocate current road-related revenues from a road fund:

- cost–benefit analysis to evaluate competing road projects based on their expected net benefits and overall priority as part of the road network
- a formula-based method that allocates funds based on the characteristics of roads and traffic, for example, population, road length and traffic flow.

A combination of the above approaches could also be used. For example, the road fund could use a formula-based approach to allocate a base level of funding for maintenance and a cost–benefit approach to fund new investments. Reliance on cost–benefit analysis alone may not provide a level of road services sufficient to meet the equity obligations of government, for example, in delivering road services to remote and regional areas.

Some participants noted that full cost recovery using user charges is inappropriate for roads in rural and regional areas where roads carry little traffic, and that such roads are largely provided to meet CSOs. Some participants also pointed to the need for transparency of any CSO payments made to road owners (Australian Logistics Council, sub. 48; Infrastructure Partnerships Australia, trans., p. 202). The Chair of the Heavy Vehicle Charging and Investment (HVCI) reform project board (trans., p. 355) noted that CSOs paid directly from taxation sources are more transparent and clearer than a cross subsidy. As noted in chapter 4, CSOs are most efficiently funded from broad-based taxes on income and consumption, which are typically levied by the Australian Government, although State and Territory and Local Governments also have the ability to tax land, which provides them with scope to levy one of the other more efficient broad-based taxes.

Regardless of the approach adopted to allocate revenues from the road fund, under current road user charging arrangements, a large proportion of road-related revenue accrues to the Australian Government (primarily through fuel excise), rather than to the states and territories. Governments will need to settle on a method for allocating revenues to road funds to address the inter-jurisdictional imbalance between road revenues and expenditures incurred. There would also remain a need to distribute funds to local government providers of roads.

The Australian Government could choose to allocate a proportion of its road revenues to road funds established by State and Territory and Local Governments, potentially using a formula-based approach. A number of issues would need to be considered in developing an effective approach, including what arrangements would best meet the needs of the road funds' expenditure program, as well as the

Australian Government's inter-jurisdictional and national transport priorities. An approach to work through these issues is proposed at the end of this chapter.

Local government road funds

Local governments could choose to adopt a version of the road fund approach using regional road funds established by aggregations of councils. Under a regional road fund approach, local councils would continue to be responsible for funding and providing local roads but could establish a regional alliance (a regional road fund) to collectively manage and upgrade existing local roads, and to deliver and fund new local road investments. The regional road fund could be established through a memorandum of agreement, which could set out the fund's governance arrangements. The relevant local councils could direct revenue from their own sources (including from council rates and road-related grants from other levels of government) to support the activities of the local road fund.

This approach would provide a valuable opportunity to generate new funds from betterment charges (chapter 4). A fund could employ the expertise necessary to develop the business case for betterment charges and seek debt funding if necessary. It would be essential for arrangements with the relevant State Government to allow for such practices to develop. The application of betterment charges would both enhance efficiency and be in the State Government's fiscal interests.

Regional provision and funding of local road projects could have a number of benefits, including:

- a reduction in transaction costs arising from an increased ability to coordinate road planning and investments across a larger network of local roads
- a reduction in the costs associated with project delivery through scale efficiencies from collective procurement, maintenance, construction and/or operation of local roads
- better expression of local road-user preferences
- enabling skills and resources to be pooled across councils, thereby increasing the quality of road investment decisions and delivery. Pooling of resources could also go some way to addressing any skill shortages in individual local councils.

These potential benefits are likely to vary depending on the characteristics of councils, including the size of the council and their respective road networks, and the skills of local government workforces. The size of local government road networks and workforces varies markedly across councils. Thus, in some large, highly urban areas it may be appropriate to establish road funds at the individual

council level (which could be a ring-fenced part of the council's operations) or to establish regional road funds with a small number of councils. In some regional and remote areas, it may be appropriate for a larger number of councils to form a regional road fund.

The potential benefits need to be considered on a case-by-case basis and weighed against the potential costs of establishing regional road funds, to determine how large regional groups should be.

The concept of delivering local government services jointly through regional groups of councils is not new. Some local councils have formed regional entities to undertake certain road-related activities and to deliver other services (box 8.3). With appropriate adjustments, these types of road and transport alliances could potentially form the foundation for establishing local road funds at the regional level.

Box 8.3 **Examples of regional provision of infrastructure services**

In Queensland, 17 Regional Road and Transport Groups have been established under the Roads and Transport Alliance — an alliance between the State Government, the Local Government Association of Queensland and local governments. These regional road groups are responsible for prioritising, investing in and delivering regionally significant road and transport infrastructure. The arrangements for the alliance, including its governance, are set out in a memorandum of agreement (Department of Transport and Main Roads (Qld) 2014).

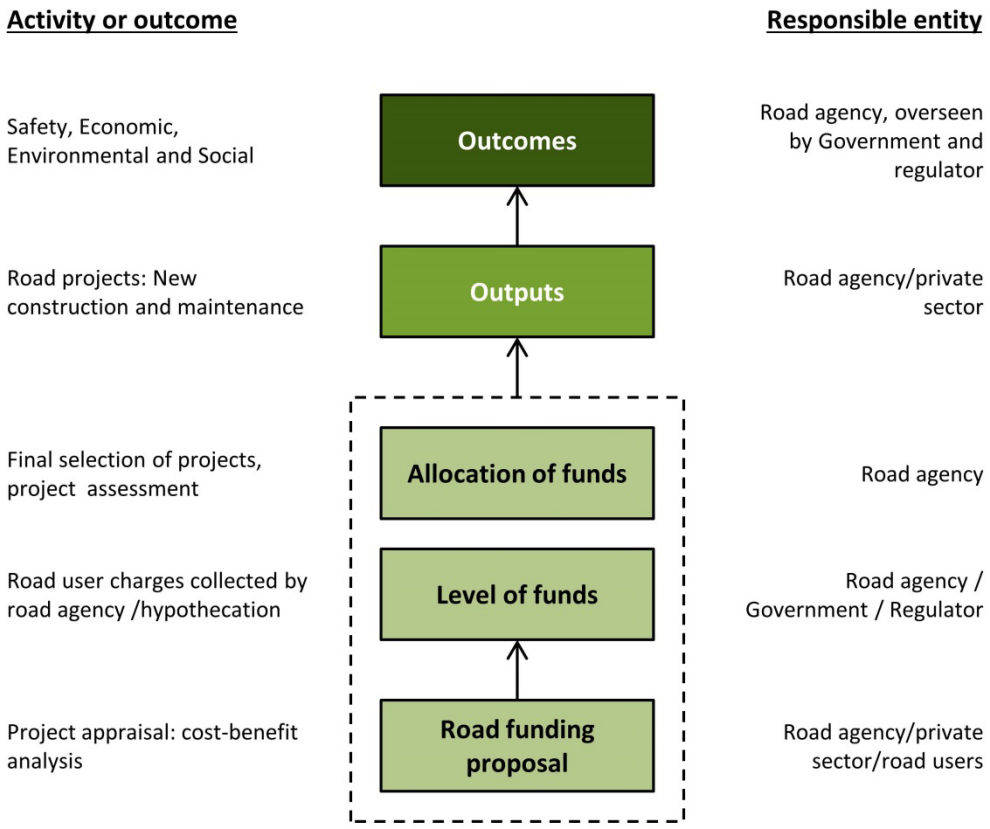
In Western Australia, Regional Road Groups are responsible for providing recommendations concerning funding priorities for various projects, and identifying strategic regional issues. However, they are not legal entities and cannot receive or administer funding (Western Australian Local Government Association, sub. DR154).

Local councils have also established alliances and regional organisations in other areas. For example, local councils have established alliances to undertake joint studies, such as water security studies and climate change impact assessments, and have formed regional organisations of councils to collectively provide some water and wastewater services (PC 2011a, 2013b). An example is CENTROC (Central NSW Councils), which identifies regional cooperation and resource sharing as one of its objectives. This is undertaken through facilitation of the sharing of knowledge, expertise and resources, and where appropriate, the aggregation of demand and buying power (Central NSW Councils, sub. 37).

A corporatised public road agency model

The corporatised public road agency model is an institutional arrangement that integrates all elements of road funding and provision into a single corporatised entity. The entity would operate on an economically sustainable basis using both funding from governments and revenue raised from direct charges on road users (figure 8.2).

Figure 8.2 **Corporatised public road agency model**



Source: Adapted from PC (2006b).

This approach would involve the creation of one or more road agencies with responsibility for operating the road network (or parts of the network), similar to corporatisation of water and electricity authorities in the late 1980s and 1990s. The agency could control and manage road assets (or may choose to contract with the private sector for the management of existing road assets or for the financing, construction and operation of new road assets), and eventually develop charges for their use, with the right to borrow and invest capital.

The agency would be an independent legal entity, with an independent board, a chairperson and chief executive, and with a statement of objectives or corporate

intent issued by the government. As with the road fund approach, board members should be appointed based on merit.

A key feature of this approach is that the road agency (or agencies) would be required to earn an adequate rate of return on road assets, fund depreciation and maintenance, and manage assets on an economically sustainable basis. The revenue requirements of the agency (and future direct road user charges) would be overseen by a regulator. Road quality and safety standards and required investment outcomes would be overseen by the same, or perhaps a different regulator.

A range of regulatory approaches could be used to establish the revenue requirements for the agency's road assets. A commonly-used approach is the regulated asset base ('RAB') approach (box 8.4). A related consideration is how the agency's revenue requirements would be recovered (funded) and what oversight arrangements would be used (a range of methods are possible as discussed in chapter 4).

Box 8.4 **The Regulated Asset Base approach**

The regulated asset base (RAB) approach employs an economic regulator to determine the revenue requirements for maintenance and investment, together with the rate of return on investment the agency has and is allowed to make in the future. The value of the existing assets can be determined on the basis of historic costs, or on the basis of the efficient provision of the service.

Under the RAB approach, capital invested is allowed to earn revenues which cover four elements:

- an allowance for the depreciation of the RAB over time
- a return on the value of the RAB (a return on capital invested), typically calculated by multiplying the RAB by a weighted average cost of capital which includes a return on equity that reflects the risk of the revenues of the business
- the forecast level of efficient operating expenditure
- the payment of tax or tax equivalents required to comply with competitive neutrality policy.

The level of investment and rates of return are reviewed periodically, often on a five-year cycle.

Although the RAB approach has traditionally been applied in utility sectors, such as energy and water, it has potentially wider application to the roads sector, and may facilitate the development and adoption of shadow tolls and more direct user charging over the longer term.

Source: OECD/ITF (2013).

In the absence of direct user charging, the public road agency's revenue requirements for the road network (or sections of the network) could be based on a unit cost per road user ('shadow toll').

Detailed consideration would need to be given to developing a regulatory and pricing approach that allows for the recovery of the efficient cost of providing infrastructure services, as well as encouraging the efficient use of infrastructure.

Some countries are considering or have established independent companies for the management of their strategic road networks, including the United Kingdom and Austria (box 8.5). These approaches vary in a number of ways including in the nature of the oversight arrangements used, and whether the entities have the authority to collect (and propose) user charges, and to raise capital to finance infrastructure investments.

Advantages and limitations of a corporatised public road agency model

Both the corporatised public road agency model and the road fund model, if designed well, could potentially generate efficiency benefits by providing the opportunity and, potentially incentives, to consider direct road user charges, improve asset utilisation, and apply more rigorous economic assessment of new investments.

Much depends on two things:

- the final governance arrangements
- the ability of the reforms to alter the existing culture of institutions.

If innovative solutions to transport issues are pursued and the corporatised road agency (or road fund) has consumer-oriented independence to select preferred investments, the models offer stronger incentives than the Departmental model to:

- provide roads only where benefits exceed costs (including a return on capital)
- find least-cost means of providing new roads or additional road capacity
- more effectively manage the road portfolio and allocate risks
- be more responsive to the preferences of road users and adopt innovative ways to improve asset utilisation to the benefit of road users.

A willingness of the relevant government to consider hypothecation in some form, and to provide sufficient funding (including to support any long-term contractual obligations) will be, as for the road fund model, essential for the success of the corporatised road agency approach. As the equity and substantial public good

aspects of road provision make full reliance on direct road user charging impractical, CSO arrangements will again also be necessary.

Box 8.5 **Examples of commercially managed road networks**

The Austrian freeway operator and toll collector (ASFiNAG)

Investment in the Austrian freeway network is handled by ASFiNAG (the 'Autobahn and highway financing stock corporation'), a government-owned corporation responsible for planning, construction, operation, maintenance, tolling and financing of the Austrian autobahn network. ASFiNAG has the right to collect tolls, or road user charges, and can propose new tolls, although the central government makes the final decision and sets the fees. ASFiNAG relies on revenue from users (both light and heavy vehicles) and does not receive revenue from the federal budget. It is able to raise finance for its investments on the capital market, with the repayment of ASFiNAG's debt guaranteed by the Austrian Government. Development of road transport infrastructure by ASFiNAG is based on the framework program issued by the Ministry of Transport, with final project approval given by the Ministry of Transport.

The UK Highways Agency

In July 2013, the UK Government set out a plan to reform its Highways Agency into a government-owned company that is accountable to the Government but has an organisational structure closer to that of a private company. The genesis of the reform was an independent review in 2011, which among other things, suggested:

- making a clear break from short-termism and a stop–start culture
- a more independent structure, allowing the strategic road network to operate more like best-performing infrastructure providers in other sectors
- a clearer, more transparent role for government, providing a strong, certain framework against which the managers of the network could be held to account.

It is intended that the Highways Agency will be funded for capital and maintenance expenditure at least every five years. The company will not have the authority to introduce tolls or charges. The Government will introduce a long-term planning program for roads, with the company expected to be involved in the development of proposals for how best to deliver these requirements. Oversight of the company will be undertaken by government (the sole shareholder of the company) with independent scrutiny to assess the company's cost, efficiency and overall performance.

Sources: HVCI (2012); Moody's (2013a); OECD/ITF (2012); UK Department of Transport (2013a, 2013b).

One challenge in implementing this approach is that it essentially requires a political decision to remove the road network (or elements of the network) from the general public budget (as with electricity and water) and to hypothecate revenue streams to the road agency. This could lead to tensions between the regulator and government regarding the required rate of investment in the network

(OECD/ITF 2013). There could also be other principal–agent issues, for example in relation to equity and risk aversion. If an existing institution is adapted to this purpose, regulator culture becomes critically important. There is also a risk that governments could claim special dividends that could leave the organisation exposed to funding pressures (chapter 2).

As with the road fund model, government may choose to override decisions of the regulator and the corporatised public road agency. However, such intervention would be transparent and all parties would be accountable for their decisions. Implementation issues would again also be substantial, particularly regarding what elements of the road network the public road agency would be responsible for.

The choice between a road fund model and corporatised road agency model would need to consider the costs of regulation. Considerable time and effort would be required to determine the most appropriate regulatory approach. The powers of the corporation and the regulator would need to be specified precisely. If the objectives of the corporatised road agency approach are not clearly specified, and the expected benefits are some way in the future, the model may succeed only in adding to the regulatory apparatus of government. There is a potential risk that regulatory arrangements may become 'locked in' and hinder the development of innovative user charging mechanisms. This may limit the scope to move flexibly down the path of direct road user charging, compared with a more flexible road fund approach.

The Heavy Vehicle Charging and Investment Reform Project

As discussed in chapter 4, the focus of the HVCI reform project was on user charging and institutional reforms for heavy vehicles. The institutional model proposed by the HVCI combined elements of the road fund and corporatised road agency models (box 8.6).

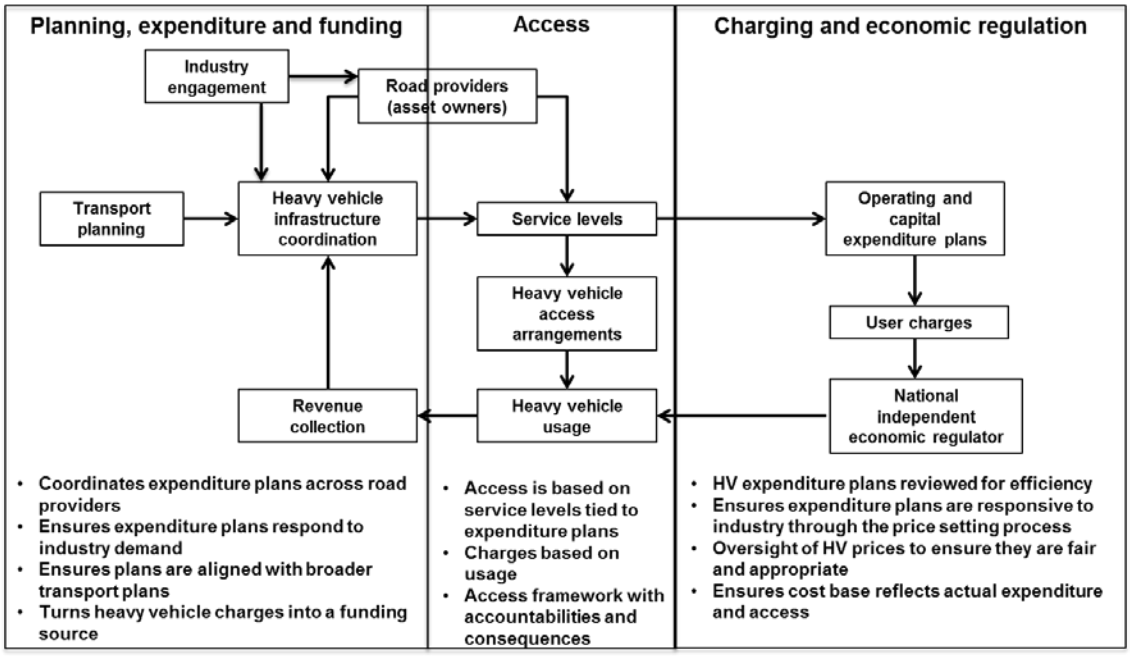
Specifically, state-based infrastructure coordinators (similar to a road fund) were proposed to coordinate expenditure plans, receive road-related revenues, and allocate funds to road providers. It was envisaged that a separate national regulator would approve road-related taxes and charges, after scrutinising a revenue requirement lodged by the infrastructure coordinator on behalf of road providers.

A number of inquiry participants were broadly supportive of the HVCI project (Australian Logistics Council, sub. 48; Asciano, Aurizon, Australian Rail Track Corporation and Australasian Railway Association, sub. 56; Local Government Association of Queensland, sub. DR143).

Box 8.6 Institutional reform under the HVCI reform project

As detailed in chapter 4, the HVCI reform project was established in response to recommendations made by the Productivity Commission in a 2006 inquiry into road and rail freight infrastructure pricing. The reforms being developed by the HVCI project were intended to ensure that charges were more cost reflective and flowed back to road providers as a source of funding for provision and maintenance. The following diagram summarises the system envisaged, which included:

- charges based on road expenditure plans developed with industry, determined based on future needs and agreed nationally consistent service levels for all roads providing heavy vehicle access.
- state-based heavy vehicle road infrastructure coordinators (funds) that work with industry and state road providers and local government to develop the heavy vehicle road expenditure plan. Expenditure plans were to be reviewed by the independent economic regulator that would subject plans to industry consultation.
- revenue flows back to road providers to fund approved expenditure plans. An independent regulator would approve efficient charges based on funding requirements for the approved heavy vehicle road plans.



HVCI anticipated that this would provide greater revenue stability for road providers, which would support improved planning and delivery of infrastructure, and provide stronger incentives to deliver agreed services in a responsive and efficient manner. Under the proposed reforms, local governments could directly receive revenues and were to be encouraged to develop regional local government groups.

Sources: HVCI (sub. 77; pers. comm., 27 March 2014; trans., p. 348; 2013); PC (2006b).

However, the Australian Trucking Association (ATA, sub. DR176) did not support the HVCI reform, as it was of the view that the user charges proposed under the reform were not cost effective and would not produce a positive change in the industry's road usage. It listed several concerns with respect to the charging regime proposed and preferred an approach that focused on improving the current system of heavy vehicle charging (discussed in chapter 4).

The ATA also called for 'no-regrets' measures that involved dividing the road network into three tiers, with each tier targeting a particular heavy vehicle access level to focus investment, reporting and funding.

> Tier 1 – primary land freight transport corridors – the highest level of access, building on [Infrastructure Australia's] national land freight network.
>
> Tier 2 – significant last and first mile higher mass limits connections – level of access below tier 1, but may align with tier 1 mass limits to ensure end to end trip productivity is achieved.
>
> Tier 3 – remaining freight network – a minimum level of access in line with current general access requirements, supplemented by ad hoc improvements overseen by the NHVR [National Heavy Vehicle Regulator]. (sub. 27, p. 5)

The ATA envisaged that funding allocations would eventually differ between the tiers as follows:

> … in three years, a transparent formula for allocating funding to road suppliers should be established. Funding allocations should reflect road costs, heavy vehicle usage and access upgrades required for Tier 1 and Tier 2 roads. This would be a superior funding mechanism than the current system where road funding allocations are dictated by how much a state budgets to spend and is recouped from the industry through the RUC [road user charges] and registration charges … The formula would also include a mechanism to fund low-volume roads, which would be classed as Tier 3, through community service obligations … (ATA, sub. 27, p. 5)

It also backed reforms to road agencies, including regular audits of road agency expenditure to verify the costs to be recovered from heavy vehicles, and benchmarking, which could be the basis of a form of incentive regulation. The ATA noted:

> … in the future there should be moves to tie funding to performance of road authorities … efficient road investment and maintenance costs could be independently assessed and tied to funding allocation. Incentives to outperform benchmarks should be provided, for instance by allowing a road supplier to retain unspent funds and invest in other priorities. (ATA, sub. 27, p. 4)

These proposals appear to focus on improving investment decision making and outcomes in the supply of road infrastructure through a better allocation of road revenues and strengthened governance arrangements for road agencies. This focus

is broadly consistent with the objective of the governance and institutional reforms set out in this chapter. That is, to improve the wellbeing of the community by better allocating resources to roads. As noted previously, road user charging reform is not a prerequisite for the adoption of alternative institutional arrangements in the road sector, although it does provide a pathway to potential adoption.

An appropriately structured road fund model or corporatised road agency model could be expected to address many of the issues raised by the ATA, as they would improve the transparency and accountability of project selection and delivery outcomes. The Commission's proposal outlined in chapter 9 to implement a detailed benchmarking framework for major infrastructure projects in Australia would also likely support the ATA's suggestion for improved monitoring and benchmarking of the performance of major road projects undertaken by road authorities.

The Commission emphasises the importance of good governance principles (as outlined in chapter 7) in the design of alternative governance and institutional arrangements for roads. In particular, there is a need for an effective user engagement mechanism to be incorporated into any reform process for roads to help address concerns raised by users and industry, including those raised by the ATA. A way forward for institutional reform in the roads sector is proposed in the following section.

Private provision of roads

The private sector can, and already does, undertake different aspects of road provision and management for various elements of the road network. Private involvement in the management and provision of roads ranges from private sector contracting for the provision of specific services (such as design, build, operate, maintain) for publicly owned roads to private financing and ownership of particular roads. Some examples are provided in appendix B.

There is scope under both a road fund model and corporatised public road agency model for the development of private roads on the same basis as today. There may also be scope for further private sector involvement as technological developments expand future road pricing options. As noted previously, both models should include active consideration of unsolicited road proposals from the private sector, particularly where these include charging arrangements which can be used to fund the infrastructure service and support an efficient allocation of resources. At the same time, the public good characteristics of large parts of the road network limit the feasibility and desirability of providing all roads privately.

8.3 Which model can most effectively facilitate improvements in road provision and charging?

Institutional reform in the roads sector would help to achieve better outcomes for the community in the provision and funding of roads. However, deciding on the most appropriate model is likely to involve significant challenges and complexities. These challenges include achieving community acceptance for the adoption of reformed road user charging schemes and coordinating the road reform effort across jurisdictions. Significant political will and commitment is likely to be needed to drive the reform effort.

The nature of these challenges suggests starting with the simpler and more flexible road fund model. As discussed below, it is essential for a road fund model to embed road user representation in its structure and include a clear objective of improving the allocation of resources for road investments.

The importance of open and transparent engagement with road users

Any of the above institutional models should include a mechanism that provides an open and transparent process for road users and other groups to identify road projects and to contribute to decisions to invest in roads and to the implementation of a reformed system of user charging.

The Automobile Association of Australia emphasised the importance of consultation as part of implementing road user charging reforms:

> … it is crucial that any reform seeking to implement a broad based system of direct road user charging needs to be a methodical, open and transparent process. To win the support of motorists it will be critical that the case for change is clearly laid out and the benefits of reform are properly explained. Road users will be more likely to accept direct user charging if they see tangible results through better infrastructure and improved congestion and safety outcomes. (sub. 65, p. 9)

The National Transport Commission also suggested that:

> … supply side reform [for roads] is likely to have support from industry and the broader community if the appropriate engagement mechanisms are developed to allow these groups to have a direct input into asset planning and investment prioritisation. (sub. DR129, p. 2)

It outlined an approach that included:

- conducting a national road network condition audit

- defining the desired road condition or service standard to be provided in collaboration with users
- determining the shortfall between desired and actual road condition or service standards
- engaging industry and the broader community to determine priority capital upgrades, maintaining prioritisation and operational activities
- developing a project investment pipeline.

A range of consumer and stakeholder engagement approaches have been used across public infrastructure sectors (box 8.7). These approaches differ in terms of the role of consumers in the decision-making process.

Effective direct industry involvement in the governance arrangements of the reform model will provide a means to achieve improved road expenditure decisions by enabling road users to contribute to project selection and funding decisions. Direct involvement of road users and the provision of information on the costs of different projects could also facilitate wider acceptance of direct road user charging mechanisms by providing greater understanding of the potential benefits and costs.

A number of industry groups could potentially serve this purpose for particular groups of users, such as the Australian Trucking Association, and the Australian Automobile Association (the latter organisation represents the views of its constituent state and territory motoring clubs — the AANT, NRMA, RAA, RACA, RACT, RACQ, RACV, and RACWA). Were institutional reform to be adopted at the state or territory level then the relevant local state motoring group could represent interests of the industry and individual motorists. In any case, particular care would need to be taken to ensure that the views of all types of users were expressed, especially those in remote and regional areas.

Transitioning to economically sustainable road provision and funding

As previously noted, the objective of the governance and institutional reforms outlined in this chapter is to improve the wellbeing of the community by better allocating resources to roads. This will be best achieved through improvements in investment, operation, maintenance and funding of roads and a transition to more comprehensive direct road user charging arrangements over the long term (where this is justified on cost–benefit grounds).

In chapter 7, the Commission has proposed that Australian Government funding of public infrastructure be tied to a set of good governance principles for project

selection, funding, financing and delivery. Implementation of this proposal is expected to improve road investment outcomes.

Box 8.7 **Some models of consumer engagement**

In recent decades, there has been increased use of different forms of consumer and stakeholder engagement in a number of infrastructure sectors. New engagement processes are aimed at achieving greater accountability in decision-making by public and private sector bodies. Engagement can take a number of forms:

- *Consultative, advisory or challenge groups* — which bring together a number of experts or representatives for consultation, challenge and advice. For example, in the energy sector, the Australian Energy Regulator has established a Consumer Challenge Panel to advise it on whether network businesses' proposals are justified in terms of the services delivered to customers and whether they are acceptable and valued to consumers. Consumer challenge groups have also been established by Ofgem and Ofwat in the United Kingdom.
- *Negotiated settlements (a form of constructive engagement)* — consumers (or consumer representatives) take an active role in negotiating price and quality issues with a regulated utility or company. This involves the users of a regulated monopoly and the monopoly owner negotiating to reach a settlement as to the costs to be funded and revenue to be collected from users. The regulator manages the negotiation process and accepts the settlement as agreed between users and the utility network owners. The regulator does not seek to make its own judgments about the outcome but may become involved if no agreement is reached. There are various examples of negotiated settlements between utilities and customer groups in North America, including those overseen by the Federal Energy Regulatory Commission in the United States and the National Energy Board in Canada (both dealing with gas pipelines), and those facilitated by the Office of Public Counsel in the US state of Florida.
- *A formal representative role* — this could include industry representation on a committee or a board. For example, the HVCI reform project was governed through a multi-jurisdictional board, which included industry members and an independent chair. However, boards must be of a practical size.

Sources: HVCI (sub. 77); Littlechild (2011); Owen (2013).

In chapter 4, the Commission has recommended that State and Territory Governments undertake pilot studies of distance and location charging for cars and other light vehicles as a first step to achieving wider reforms for direct road user charging. These pilot projects would provide valuable information on both the economic and social implications and issues of adopting direct road user charging in Australia. However, road pricing reform is not a necessary precondition for the adoption of the institutional and governance arrangements outlined in this chapter.

In addition to the above reforms, the Commission considers that substantial gains could be achieved by transitioning to an economically sustainable approach to the provision and funding of roads. The first step in this transition should be the establishment of road funds at the state and territory level.

Local governments could also be supported by their state government and local government association to adopt the road fund approach using regional road funds, particularly in regional areas.

Both State and Territory and Local Government road funds should integrate the tasks of road funding and provision into one entity, to enable road charging and provision to be more effectively considered on a regional portfolio basis.

In light of the recent decision to bring back into government hands the HVCI project (chapter 4), there is scope for a road fund model to incorporate road provision and funding for both heavy and light vehicles. There would be merit in adopting a combined approach as most roads, and associated investment decisions, address the needs of both light and heavy vehicles.

The Commission acknowledges the extensive work undertaken to progress both charging and institutional reform for heavy vehicles by the HVCI reform project. The analysis and lessons from the HVCI reform process will be directly relevant to the planning, development and implementation of road funds.

State governments and local government associations should actively encourage and support local governments to form regional road funds for local roads. They could do this through capacity building mechanisms (such as by providing specialist expert and technical assistance), and ensuring there are no legislative impediments to the forming of such funds or to developing betterment options or other cooperative arrangements.

The principal role for the Australian Government in the development of road funds should be to provide strong practical support for reform, including by offering scope for redirection of resources to the new road funds.

To be effective, state and territory and regional road funds would need to have access to an adequate and sustainable source of funds, and a significant degree of autonomy. They would also need transparent processes (with road user representation embedded in these institutional processes) for determining the level and allocation of funds to road investments. Further, where State and Territory Governments choose in the future to adopt a policy of direct user charging, the road fund should be given authority to design and levy road user charges or to recommend to Government the level of road charges that should apply. The road

fund reform process should also involve systematic post-project evaluation and periodic review.

The success or otherwise of state and territory and regional road funds could inform the case for transitioning further to the adoption of the corporatised public road agency model discussed in this chapter.

RECOMMENDATION 8.1

The first step in a long-term transition to a more efficient and effective approach to the provision and funding of roads should be the establishment of Road Funds by State and Territory Governments. State Governments, and local government associations, should actively encourage and support local governments to form regional Road Funds for networks of local roads.

To be effective, Road Funds should:

- ***have the objective of clearly linking road-user preferences with investment and maintenance decisions***
- ***integrate the tasks of road funding and provision***
- ***have a significant degree of autonomy***
- ***have access to adequate revenue to meet the costs of the road network they administer, as required by the relevant road users***
- ***entail transparent processes for determining the level and allocation of funds***
- ***include an open and transparent procedure for direct involvement of road users and consultation with the broader community on project selection, funding, and road charging decisions***
- ***involve systematic post-project evaluation and periodic review of the arrangements.***

The implementation of Road Funds should take into account the research and analysis developed for heavy vehicles by the Heavy Vehicle Charging and Investment reform project.

The need for coordination and commitment from governments

As is evident by the HVCI reform effort and the challenges experienced in proceeding with its implementation, comprehensive reform in the roads sector is likely to be a long journey, requiring significant commitment and effort from governments.

Coordination across jurisdictions to address interactions between road networks and support national and interstate priorities will need to evolve with the road fund concept. Issues of considerable complexity and detail include:

- the sources of road revenues directed to road funds
- what parts of the road network the road fund/s would cover
- the principles and frameworks for setting road user charges
- the method for allocating funds to road projects
- what additional user consultation and oversight/regulatory arrangements would be involved, beyond the direct representation of road users, which is a central element of the proposed road fund model.

To address coordination issues, there would be merit in the reform process including all levels of government through the COAG Transport Infrastructure Council, the National Transport Commission, industry and other stakeholders. However, the Commission does not consider a formal national agreement on institutional and governance reforms for roads to be necessary for the road reform effort to commence. Indeed, some jurisdictions may choose to adopt different forms of road funds or move immediately to a corporatised public road agency model.

The gains from the Commission's proposed reforms derive largely from the key factors outlined earlier — an alteration to the culture of existing institutions, direct involvement of road users in resource allocation decisions, better incentives for decision makers to allocate resources efficiently, and revised arrangements for allocating revenues. If effectively incorporated into road fund arrangements, these factors will help to provide road users with confidence that the reforms will deliver road investment outcomes that they prefer and are willing to fund. As such, they are an important factor to build support for more efficient user charging.

These factors could be incorporated into road funds in a number of ways. Governments should be free to design and implement approaches that best align with their needs and preferences, rather than adopt a uniform national approach to what is primarily a State, Territory and Local Government issue.

Given the short time frame and wide scope of this inquiry, the Commission has been unable to properly consider the complex design and implementation issues associated with establishing road funds. As noted recently in a discussion paper published by Infrastructure Partnerships Australia:

> … the scale of reform needed to deliver a fairer, simpler and sustainable model for taxing and funding road transport will require deep public debate and detailed consideration by transport policymakers. (2014, p. 10)

It suggested that the Productivity Commission be directed to undertake a public inquiry into the funding, regulation and pricing of Australia's road transport market, and related impacts in the broader transport market.

The Australian Government could support the road reform efforts of State and Territory and Local Governments by offering the services of the Productivity Commission to help design the detailed framework and rules that would be essential to the implementation of road funds. This work could include developing an approach by which the Australian Government could direct road revenues to State, Territory and Local Government road funds.

RECOMMENDATION 8.2

There are complex issues associated with establishing Road Funds, such as determining what sources of road revenues should be directed to Road Funds (including Australian Government road revenues) and the method of allocation.

The Australian Government should assist in this reform effort by directing the Productivity Commission to undertake a public inquiry on the design and implementation of Road Funds.

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