Australian Government
Productivity Commission

Public Infrastructure

Productivity Commission
Draft Report
Volume 1

March 2014

This is a draft report prepared for further public consultation and input. The Commission will finalise its report after these processes have taken place.

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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.

Further information on the Productivity Commission can be obtained from the Commission's website (www.pc.gov.au) or by contacting Media and Publications on (03) 9653 2244 or email: maps@pc.gov.au

Opportunity for further comment

You are invited to examine this draft inquiry report and comment on it by written submission to the Productivity Commission, preferably in electronic format, by Friday 4 April 2014 and/or by attending a public hearing.

The final report will be prepared after submissions have been received and will be forwarded to the Australian Government in May 2014.

Further information on how to provide a written submission or register your attendance at the public hearings (as a participant or an observer) is available on the inquiry website: www.pc.gov.au/projects/inquiry/infrastructure.

Public hearing dates and venues

Location	*Date*	*Venue*
Melbourne	Wednesday 9 April 2014	Productivity Commission Rattigan Room Level 12, 530 Collins Street
Brisbane	Friday 11 April 2014	Mercure Hotel Brisbane Burke Room 85-87 North Quay
Sydney	Monday 14 April 2014	The Grace Hotel Pinaroo 5 Room 77 York Street

Commissioners

For the purposes of this inquiry and draft report, in accordance with section 40 of the *Productivity Commission Act 1998* the powers of the Productivity Commission have been exercised by:

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

Disclosure of interests

The *Productivity Commission Act 1998* specifies that where Commissioners have or acquire interests, pecuniary or otherwise, that could conflict with the proper performance of their functions during an inquiry they must disclose the interests.

Dr Warren Mundy has advised the Commission that he:

- became a director of the Sydney Desalination Plant Pty Limited on 1 February 2014, and provides planning and pricing advice to several Australian airports through Bluestone Consulting Pty Ltd.

Contents

The Commission's report is in two volumes. **This volume 1 contains the Overview, draft recommendations and findings, and chapters 1 to 7.** Volume 2 contains chapters 8 to 14 and appendixes A to D. Below is the table of contents for both volumes.

Volume 1

Volume 2

Abbreviations and explanations

Abbreviations

ADI	Authorised Deposit-Taking Institutions
ALC	Australian Logistics Council
APAC	Australian Pacific Airports Corporation
APRA	Australian Prudential Regulation Authority
ATO	Australian Taxation Office
BOO	Build-Own-Operate
BOOT	Build-Own-Operate-Transfer
COAG	Council of Australian Governments
CSO	Community Service Obligation
DBFM	Designs, Builds, Finances and Maintains
DBFO	Designs, Builds, Finances and Operates
GDP	Gross domestic product
GFC	Global Financial Crisis
GNSS	Global Navigation Satellite System
CRRP	COAG Road Reform Plan
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
IGA	Intergovernmental Agreement on Federal Financial Relations

IFWG	Infrastructure Finance Working Group
IPART	Independent Pricing and Regulatory Tribunal
IRR	Internal rate of return
LRMC	Long-run marginal cost
LTNZ	Land Transport New Zealand
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

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.***
Requests for further information	*Information requests are paragraphs highlighted using italics, as this is.*

OVERVIEW

Key points

- The overriding message of this draft report is the need for a comprehensive overhaul of processes in the assessment and development of public infrastructure projects.
  - There are numerous examples of poor value-for-money arising from inadequate project selection.
  - Without reform, more spending will simply increase the cost to users, taxpayers, the community generally, and the provision of wasteful infrastructure.
- 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 infrastructure services.
- Well-designed user charges should be used to the fullest extent that can be justified. However, governments will have to at least partly fund some infrastructure projects and address equity issues.
- Significant road pricing and institutional arrangements are proposed to create more direct links to road users and to take advantage of advances in vehicle technology.
- Only if implemented well does private sector involvement in infrastructure provision and/or financing deliver efficiency gains.
  - But private financing is not a 'magic pudding', ultimately users and/or taxpayers must foot the bill.
  - Government guarantees and tax concessions are not costless.
- Governments have the capacity to fund more projects than under current fiscal and debt management practices provided the reform package in this report is implemented.
- Data problems beset the detailed analysis of the costs and productivity of public infrastructure construction, and of the effects of various policies. A coordinated and coherent data collection process can 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. 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 has been sluggish. There is no conclusive evidence that Australian levels of productivity in construction are higher or lower than comparable countries.
- Despite significant concentration in the market for large public infrastructure projects, the market appears to be workably competitive. However, there are some uncertainties, including whether this applies across all market segments.
- There is significant scope to improve public sector procurement practices and to lower bid costs for tenderers, with potentially large benefits for project costs and timing.
- The industrial relations environment in the construction industry remains problematic, though this appears to mainly relate to 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.

Overview

Governments are involved in the provision of infrastructure because they wish to ensure equitable access to services across the community. In addition, there is a range of 'market failures' that could lead to inadequate provision if decisions were left entirely to the private sector.

Governments in Australia have historically taken responsibility for most aspects of public infrastructure provision. However, over recent decades there has been increasing recognition of the benefits that can come from greater private sector involvement.

The provision of infrastructure has become an increasingly significant issue for governments, the community, private businesses and investors. There are several drivers of this interest.

- 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 notions of an infrastructure 'deficit'.
- Concerns about the costs of delivering new public infrastructure and the potential for efficiency gains in delivery and in 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 social infrastructure, for which there is limited capacity to fund by 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 by the G–20 and elsewhere. For example, in the United Kingdom, other European countries, and Canada, significant effort and expense has been devoted to developing and applying various public private partnership (PPP) models that have the potential to improve the selection of infrastructure projects and the way in which they are delivered across a wide variety of sectors.

What has the Commission been asked to do?

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

- 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
- 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:

- 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 — this can involve restricting other land uses for many years
- changes over time in industry structure, population size and density across and within regions that can be difficult to predict
- important differences across the various types of infrastructure
- presence of market failures, especially externalities and natural monopoly
- need to address efficiency, productivity and social objectives.

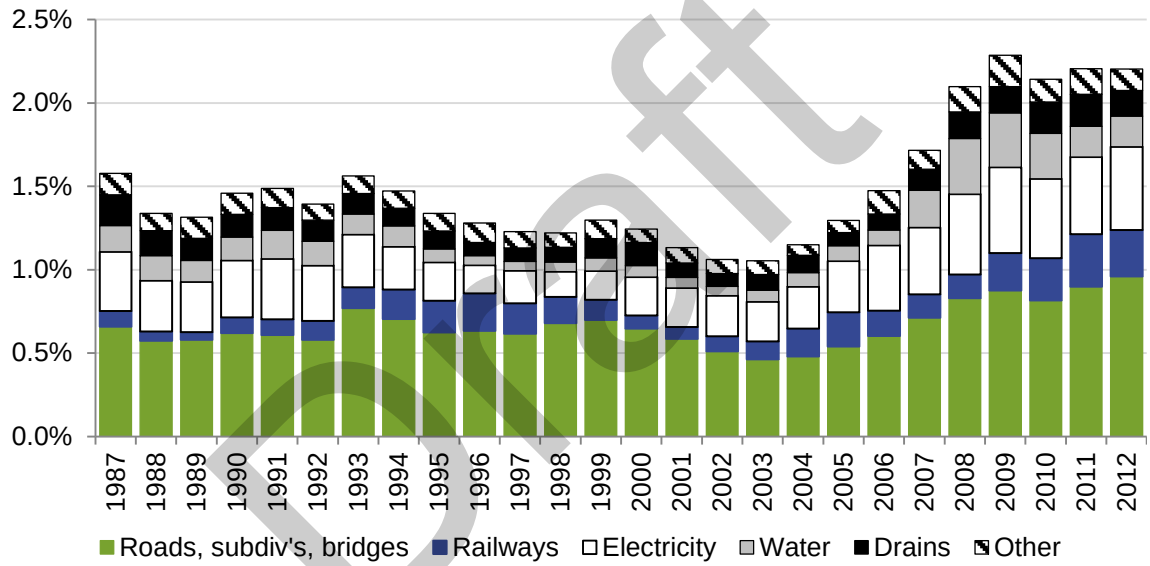
'Provision' is used in this report to mean taking the decision to provide the infrastructure. In contrast, 'delivery' is used to denote the method by which public infrastructure services are delivered to the community.

The terms 'funding' and 'financing' are often confused. 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 PPP is used broadly in this inquiry to cover procurement models involving some private capital.

Expenditure on the delivery of public infrastructure is significant. Engineering work done for the public sector has been equivalent to more than 2 per cent of GDP since 2008 (figure 1). Much of this has involved roads, subdivisions, bridges and electricity infrastructure. There has also been a significant amount of investment in buildings for the public sector, such as hospitals.

Figure 1 **Expenditure on engineering construction work for the public sector, as a percentage of GDP**



Efficient infrastructure provides services that can 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 at once expensive to maintain and unnecessary, as once famously opined by Bert Kelly (box 1).

Box 1 **A cautionary tale about public infrastructure spending**

I tried to point this out to the government before they committed themselves to building the big dam on the Ord, but there was an election looming and *at each election I can feel a dam coming on*. We may not know what to do with the water we store in these dams or whether we will have to ask the taxpayer to subsidise the crops we grow with the stored water, but building dams makes us feel better somehow. And the opening ceremony offers a marvellous opportunity for eloquence and phrases like 'the desert shall blossom as the rose' come bubbling out of the officiating statesman.

Source: Kelly (1982, p. 150).

Accordingly, the policy making, provision and procurement of public infrastructure — seen as simple in some public contributions to the debate — encompasses a complex and politically perilous range of decisions. The issues need to be evaluated carefully to ensure that the long-term net benefits are not undermined to chase short-term benefits.

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, project selection and risk allocation, that achieve the highest possible 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, particularly when using PPPs.

There is scope to do much better

There are many examples in Australia of inadequate project selection leading to costly outcomes for some users and taxpayers in general. Examples at the state level include electricity networks and desalination plants in some. An Australian Government example is the decision by the previous government to proceed with the National Broadband Network without doing a thorough analysis of its costs and benefits. The need for a comprehensive overhaul of poor processes in the development and assessment of infrastructure investments is the key message of this draft report. All other desirable or aspirational objectives — project pipelines, increased government funding, greater opportunity for patient equity, cost savings and even user charging and pricing reform — depend for their efficacy ultimately

on having a much-strengthened and widely-applied set of credible and welfare-enhancing reforms.

There has been growth in the private financing of infrastructure projects, including through the use of PPPs — although this has slowed following the global financial crisis and the commercial failure of a number of toll roads. This has led to increased scrutiny of, and focus on, various private financing mechanisms. The outcomes from PPP infrastructure projects have been mixed, as illustrated in box 2. This experience is consistent with that internationally.

Box 2 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 due to substantial operating losses stemming from a low initial bid price and the inability of the private sector consortia to make the efficiency gains originally assumed. Similarly, the New South Wales 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 a public sector point of view. For example, when tolls were introduced on the Clem7 motorway in Brisbane, patronage was around one third what had been forecast. Within a year, the private party was put into receivership, and the (government-owned) Queensland Motorways eventually acquired the $1.3 billion project for $618 million. However, some participants have claimed that this and other investment losses, such as the Cross-City Tunnel in Sydney, have caused private investors to be less willing to take on patronage risk in subsequent projects.

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. The Commission has also commented previously on the success of the Australian Government's airport leasing program and a similar approach has been adopted by some states in recent port transactions.

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 (with the exception of toll roads in a very limited number of cases).

There have also been increasing concerns about costs and productivity within the sector. 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 the 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, providing almost half of the users with an opportunity to use a significant part of the road free of charge.

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 — especially scoping and developing transparent cost–benefit analyses, rigorous demand forecasting, investigating project risks fully (including latent risks borne by governments), and 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

It is the role of governments (the Executive selected from elected representatives) to create the conditions necessary for its institutions and governance arrangements to operate effectively. To this end, it is important that governments commit to, and support, their appropriate institutional arrangements, particularly when alternatives might be politically expedient.

Improving decision making by governments

Selecting the right projects (or provision) is the most important aspect of achieving good outcomes for the community from public infrastructure irrespective of the financing approach ultimately chosen. 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 analysis is an important starting point for guiding project selection and improving the transparency of decision making. This should be augmented with a real options analysis where appropriate. 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.

The institutional and governance arrangements within which project proposals are analysed and decided upon are also vital (discussed later). Reforming these arrangements can help to avoid the types of project selection biases and problems that have occurred in the past.

Role of risk analysis and allocation by governments

The overarching motivation for involving the private sector in the delivery of public infrastructure services is to improve the economic efficiency by which services are delivered to the community (box 3). Privatisation that does not have this as its primary objective is at risk of sub-optimal outcomes. In some cases, such as at major airports, the private sector has replaced government and is making efficient decisions regarding project selection.

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 services.

Private sector involvement involves additional risks 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 transaction costs associated with negotiating and contracting with private parties.

In effect, involving the private sector through a partnership can unleash substantial gains. Yet there are greater risks, too, if there is poor project selection and/or the contracts with the private sector are inadequately written. A PPP project can go awry. The best way to prevent this is by high-quality analysis of the project parameters by appropriate experts employed by the government.

Box 3 **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 appropriate 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.

Risk allocation arrangements are most efficient when risks are credibly allocated to the contractual party best able to manage and price them and when rights and responsibilities to manage risks are clear and enforceable.

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 one-size-fits-all approach to determine risk allocation, the most appropriate level of private sector involvement, or the particular procurement model to deliver public infrastructure services.

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 appropriate in others. In principle, the choice of delivery model should be based on providing the best value-for-money to the community from

delivering public infrastructure and services. Of course, value-for-money also depends on how well projects have been selected in the first place.

Once again, realising the potential benefits from private sector involvement rests on the presence of strong institutional and governance arrangements, supported by a strong capability and commitment by all parts of governments.

Funding

Funding of the investment costs of public infrastructure ultimately has to 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 charges should be used to the fullest extent that they can be justified. Efficient user charges are an effective means to reveal willingness to pay for new infrastructure and to improve the use of existing infrastructure. User charges are already the norm for most types of economic infrastructure, such as electricity, telecommunications, gas and water. 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. Additionally, where infrastructure provides benefits over generations, user charges too can span generations if they properly reflect the effective life of the assets concerned.

The major exception to the implementation of direct user charges is roads (although there are some toll roads and there is some progress in implementing heavy-vehicle charging).

For cars and other light vehicles, governments should undertake pilot technical studies of (revenue-neutral) direct road user charging 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.

Further, 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 at least partly fund some types of public infrastructure. This can be warranted when it is impractical to exclude

users who do not pay direct charges, the transaction costs exceed the benefits, the wider beneficiaries are difficult to identify or very diffuse, and/or infrastructure is provided to meet equity goals. That is why a mix of government funding and direct charging will remain appropriate for roads, public transport and social infrastructure. In other words, it is an unavoidable reality that some public infrastructure that generates benefits for the community ultimately requires funding by governments. In certain cases, user charges might be able to recover the operating and maintenance costs of an infrastructure project but be insufficient to recover fully the investment costs.

Where needed, government funding should generally be sourced from broad–based taxes on income, consumption or land 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. So it has a vital role to play in funding infrastructure spending by the State and Territory Governments, as well as 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 possible, and to improve project selection, delivery and the collection of data and information to inform decision-making by governments about future infrastructure projects.

The potential opportunities for new forms of user charging would be explored in conjunction with institutional models (and policy frameworks) needed to facilitate implementation and community acceptance of these new directions. This is discussed below under institutional and governance arrangements.

It is possible that governments, having recently articulated a renewed commitment to infrastructure investment, may be called on to expand funding. The Commission advises caution in creating any model — fund, bank, guarantee facility, or similar proposition — prior to reforming the governance arrangements for project selection and delivery. Some of these models are likely to be suboptimal even when the governance arrangements are sound. The Commission will be more definitive about the merits and demerits of various models in its final report.

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.

PPPs are not a magic pudding

As noted in box 3, there can be benefits of PPPs. 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 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 inter-temporal 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, then this creates a liability that needs to be funded from taxes and/or user charges, and has an impact similar, perhaps greater, to direct government borrowings. Some forms of availability payments have been developed for road projects that are of this kind. Ultimately, ratings agencies see all claims on government as the same. There is no magic pudding.

Australian governments have the capacity to fund higher levels of public infrastructure provision than provided for under current fiscal and debt management practices. Use of this capacity is justifiable for projects of demonstrable high net social benefit but of lesser commercial value to the private sector. However, proper assessment of projects and efficient delivery is crucial in these circumstances. Therefore, the implementation of the Commission's proposed package of reforms is essential to achieving value-for-money on behalf of taxpayers and the community more generally.

Potential for 'second best' benefits

PPPs might assist in putting greater exposure on governments' self-imposed capital expenditure caps where these have no valid economic rationale. Governments appear unwilling to raise taxes (or reduce other expenditure) or increase government borrowings to invest in public infrastructure that is worthwhile from the community's point of view. In this situation, to the extent that the user charges can be used to fund the return on investment, private sector provision might offer a way to increase the delivery of infrastructure that would not otherwise be provided by the government.

Potential costs of PPPs

The benefits of using PPPs need to be offset against the higher costs relating to development, bidding, contracting and ensuring appropriate risk allocations.

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 government expenditure are transferred to taxpayers, and this imposes a cost on taxpayers and the community in general.

In the light of these risks to the taxpayer, 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 bond rate and commensurate with the higher risks of the project.

In principle, PPPs might be privatised 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 not exist for a well-designed PPP contract). This approach has been successfully used by the Australian Government with respect to airports and by a number of states in relation to major ports and electricity. The Commission is recommending states proceed with the sale of any remaining assets of these types, subject to good sale processes. It is also seeking views on what other infrastructure assets held by the Australian, State, Territory and local governments should be privatised by way of sale or long-term concession.

PPPs with project 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 — there is no free lunch provided by the private sector.

Participants' views on private financing and risk allocation

The finance issues raised by many participants focus on shifting the uncommercial component of public infrastructure investment to governments. That is, reallocating some of the project risks back to governments. Many participants argued that the

commercial failure of some high-profile public infrastructure projects, combined with the global financial crisis, has meant that it is currently uncommercial to allocate certain risks to the private sector (particularly demand risk for greenfields public infrastructure). Like all cyclical examples of alternations between exuberance and risk aversion, this attitude might well be shifting as the most recent example of private failure becomes more remote.

The views of participants imply that there is currently a gap between governments' assessment of the value of public infrastructure projects to the community and their 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, 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. That is, there is no shortage of private capital for commercially sound projects.

Nevertheless, some interesting proposals were floated by participants. Most notably, Industry Super Australia has proposed an inverted bid model for equity-raising, based on bidding an equity rate of return for a project. This model, along with potential variants raised by the Commission, as well as other preferred bidder models, might be worthy of further consideration. The Commission invites participants to provide feedback on this and other funding and financing mechanisms raised by participants.

Improving institutional and governance arrangements

Irrespective of financing solutions, the big issue remains — assessing projects and ranking projects to ensure that the community is getting infrastructure and services that it considers most valuable and are willing to pay for, one way or another.

Reforming governance and institutional 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

Any institutional arrangement for the provision and delivery of public infrastructure should incorporate good governance arrangements (box 4).

Box 4 **Good governance arrangements**

Good governance arrangements should include:

- the principal objective of ensuring that decisions are undertaken in the public interest
- clear and transparent public infrastructure service standards
- effective processes, procedures and policy guidelines for planning and selecting public infrastructure projects, including rigorous use of cost–benefit analysis and transparency in cost–benefit assessments, public consultation, and public reporting of the decision (including a review of the decision by an independent body, for example, an auditor-general or Infrastructure Australia)
- efficient allocation and monitoring of project risks between government and the private sector
- use of transparent and competitive processes for the selection of private sector partners for the design, financing, construction, maintenance and/or operation of public infrastructure
- sufficiently skilled employees that are responsible and accountable for performing their functions.

Good governance arrangements are necessary, but to be effective, it is imperative that there is commitment to them by governments (the Executive selected from elected representatives) particularly when alternatives might be politically expedient.

To facilitate adoption of these arrangements by other tiers of government, the Australian Government should make eligibility for Commonwealth funding conditional on compliance with a set of good practice governance principles and policy processes. 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. The Commission is seeking views on the merits or otherwise of this proposal.

Some participants have suggested that there needs to be a ‘pipeline’ of public infrastructure projects. The term can mean different things to different people. The Commission does not see merit at this stage in the Australian Government publishing a list of projects into the future. Publishing such a list would not address the fundamental impediments to achieving the efficient provision of public infrastructure in Australia. However, the package of reforms advocated in this report should naturally lead to the disclosure of considerable information, such that funders and constructors would have a reasonable indication of the general nature of future public infrastructure. This would constitute an effective ‘pipeline’. The Commission is seeking views on this matter and how the intention of other government and private infrastructure procurers can be indicated to the construction market in general.

Alternative institutional arrangements for road provision

Achieving reform in the road sector is challenging, not least because it requires community acceptance for the adoption of road user charging schemes. Some progress has been made with the COAG Heavy Vehicle Charging and Investment project. Despite this, extending reforms to cars and other light vehicles is likely to be a long journey requiring significant commitment and effort from all levels of government, as well as building community support. There are many practical and policy issues to be addressed.

Transitioning to new institutional models for road provision might facilitate community acceptance of more direct user charging in the long term and improve funding and provision of road services for cars and other light vehicles in both the short- and long-terms. There are two broad types of models: the road fund model and the regulated public road agency model. New Zealand has experience with versions of the road fund model.

Either model would need to be subject to the good practice governance arrangements outlined above in box 4. Furthermore, the amount of revenue going into each institution should not be locked in, but rather, vary over time to meet the requirements of the road program, assessed by taking into account the Government's equity obligations and selection of road projects yielding the highest net benefits to the community. This is designed to prevent road providers' revenue sources from being seen as a 'honey pot'.

The Commission is seeking views on the merits of such proposals.

Some participants have suggested the creation of a national infrastructure fund. The Commission has not been convinced of the desirability of such a fund. However, if the Australian Government were to consider such a fund, then it should avoid announcing the specific size of the fund, for the same reasons outlined above for the road funding model. While funds would obviously need to be accounted for in the budget, they could be assigned as a contingency fund and drawn upon as deemed prudent.

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 much needed 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. These 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 2). They also vary significantly by region and state, so project location can make a large difference to costs.

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 and road projects in built up areas (figure 3).

Figure 2 **Land prices have risen well above inflation — 1993 to 2012**

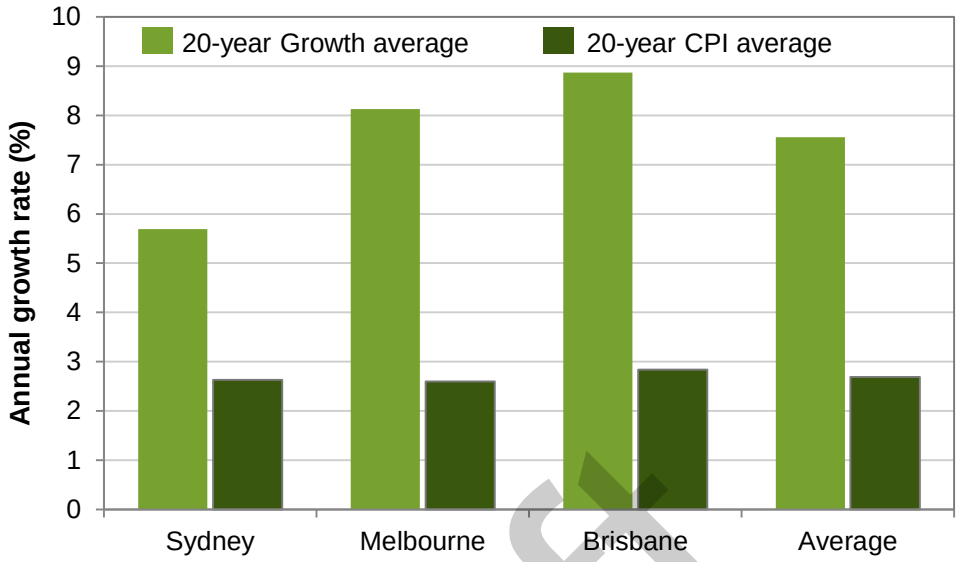
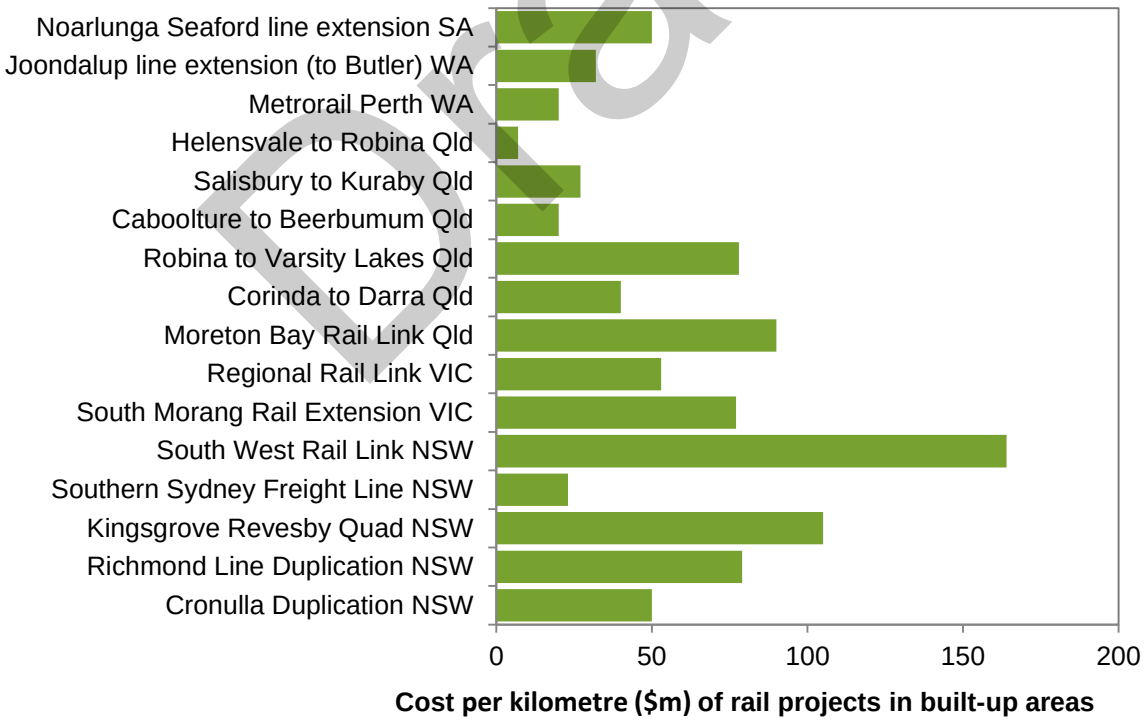


Figure 3 **Rail construction costs vary enormously**



It is likely that many of these variations reflect the varying 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 concerns. Sometimes there is no choice but to build a road underground. 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.

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 some major construction projects but the 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. The Commission recommends that the Australian Government should introduce a detailed benchmarking framework for major infrastructure construction projects throughout Australia, with the collection of data being a requirement when the Australian Government provides funding. Regardless of any such requirement, governments and private sector infrastructure providers throughout Australia have a strong interest in participating in a coordinated approach.

Productivity

Over the last two decades, labour productivity growth in construction has been sluggish compared with the rest of the economy. In contrast, multifactor productivity (MFP), which measures output per unit of a composite of capital and labour inputs, has kept pace with other industries. The results can be reconciled because of the greater increase in capital productivity in construction (which itself is testimony to the fact that construction output has still grown, notwithstanding relatively low capital investment). 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.

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 construction productivity performance. The Commission will be further considering Australia's international productivity ranking.

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.

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 (those relating to design, industrial relations and workplace safety) 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 could be provided to potential bidders in much the same manner that governments provide information on site risks to constructors as a means 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 scope to improve the quality of the information used to assess tenders. Better 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 more 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.

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 and innovation programs).

Similarly, excessively tight rules on probity — a form of 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

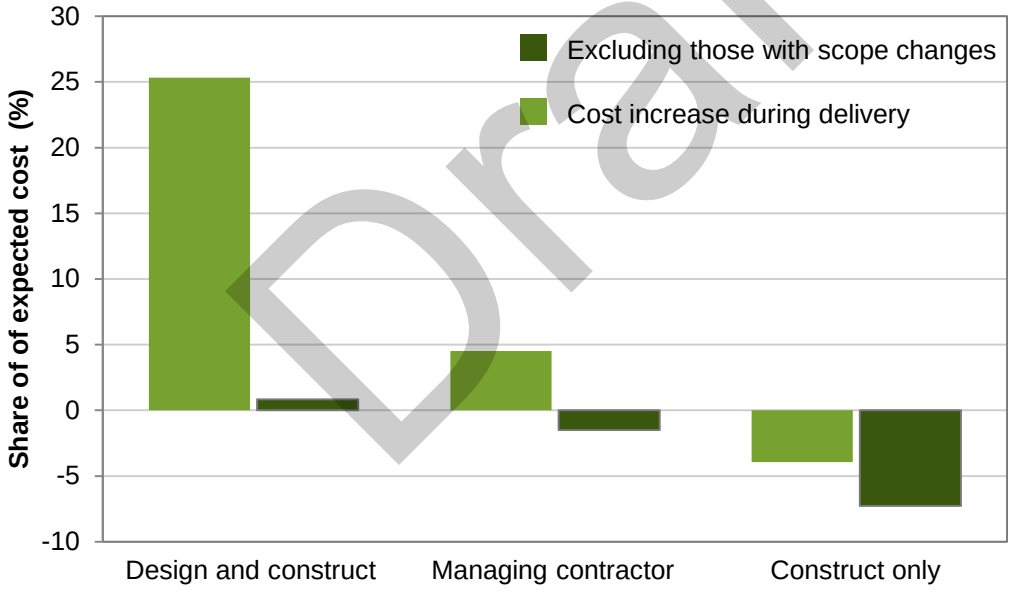
Once the client has identified the successful tenderer, the operation of the contract is critical in determining final project costs. Contracts contain various pecuniary incentives for contractors to identify options that minimise construction cost, but proper project oversight by the client remains an important role. An informed 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 procurement processes 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,

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. Further, where costs did overrun the contracted amount, most was due to the government client changing the scope of the project after contracts were signed (figure 4).

Nevertheless, even governments have acknowledged that project management has sometimes been deficient (as has procurement more generally). Several governments have developed specialist major procurement agencies that 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 4 **Cost overruns during delivery mainly stem from government clients changing the scope of the project**



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

Market concentration has potentially played a role in cost pressures, with many citing the presence of a 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 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 made them stick with 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.

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 new runway at Brisbane Airport, costing around $1 billion, is being largely undertaken by a foreign dredging contractor and a local second tier constructor. Similarly, two foreign contractors and a local second-tier constructor are constructing the Northern Link tunnel in Brisbane (costing around $1.5 billion).

Further, government clients have some scope to exercise countervailing power, and have increasingly packaged major projects into smaller parts to increase the number of potential bidders.

It should also be noted that the Australian Competition and Consumer Commission has not found cause to block any of Leighton Holdings or Lend Lease's acquisitions or mergers, nor has it taken action against them for competition purposes.

At this stage, the Commission has not found tangible evidence that the current structure of the infrastructure construction market diminishes competition in ways that would significantly inflate infrastructure costs. That said, there are some residual concerns, which should be addressed through:

- ensuring that the current review of the Federal OHS accreditation scheme, as well as addressing compliance costs for local firms, examines the 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
- the greater use of pro-competitive procurement policies such as project packaging, since not all governments use this approach as much as they could.

However, the conclusion that the current market structure is not significantly affecting competition is tentative and uncertainties remain. For instance, because the broader market is segmented by the type, location and size of projects, there may be insufficient competition to adequately constrain prices in some parts of the market. What impact such aspects of the infrastructure construction market have

had on competition and, in turn, on the costs of infrastructure is presently unclear, and the Commission is seeking more information and evidence on these matters.

It has also been suggested that 'sweetheart' deals involving generous site-wide enterprise bargaining agreements between some unions and head contractors has relinquished the potential savings from using sub-contractors that have achieved lower costs by striking more commercially-sound enterprise agreements.

Industrial relations

The industrial relations (IR) environment in construction has long been seen as problematic, with greater than average levels of disputes, concerns about excessive union control of work sites, expedient deals between head contractors and unions to buy industrial peace and preserve the market advantage of good relationships, and unlawful conduct. Multiple reviews have found criminal conduct and intimidation as a feature of certain projects — mainly involving building projects — and this has fuelled industry-specific arrangements — including IR building guidelines and the creation of industry-specific regulators. A prominent concern is that union and employer behaviour is not only fuelling unlawful conduct, but also frustrating productivity and raising costs.

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, particularly in relation to civil, rather than building, construction
- 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
- higher productivity growth rates do not appear to be strongly coincident with the new construction-specific IR arrangements that commenced in 2002
- labour earnings growth seems more likely to reflect labour shortages than growing bargaining power
- 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 widespread unlawful conduct (mostly of a civil nature) and adverse IR cultures throughout the industry. Overwhelmingly the issues centre on general rather than civil 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 to be the subject of a freshly announced Royal Commission
- A sample of enterprise bargaining agreements (EBAs) reveals inexplicable variations in terms and conditions, potentially excessive powers for some union officials and constraints on workplace flexibility likely to be inimical to productivity.
- 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.
- While the current system is designed to allow individual businesses to negotiate terms and conditions with their employees that suit the circumstances of both the business and employees, various pressures by the head contractor and the principal unions can frustrate this. Jump-up clauses in a greenfields agreement can result in the same wages and conditions across a building site for all contractors (even if they had enterprise agreements in place with different terms and conditions). That and other practices may lead to the adoption of implicit pattern bargaining (which leads to the same agreements across multiple employers on multiple sites).

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 (with more limited accountability), higher penalties, and the capacity to still investigate matters where the union/s and an employer had reached an agreement after an industrial dispute.

While it would seem likely that the more powerful IR regime under the ABCC would be more effective at stemming unlawful conduct and in encouraging improved work practices, the evidence of apparent improvements in productivity or cost reductions due to the regime is relatively weak. It may be that the ABCC has had more impacts on unlawful conduct and on productivity and costs at particular sites than in achieving substantial productivity growth rates across the industry as a whole.

However, IR reform in the construction industry should not rely on an over optimistic aspiration that it will produce large industrywide productivity increases. The hurdle for action is much lower. There is enough evidence of site disruption, coercion and excessive enterprise bargaining arrangements to make changes.

A sensible starting point is for all jurisdictions and the Australian Government to deploy the Victorian guidelines for their building codes. 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.

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

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 Victorian 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.

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 the employer's incentive to provide training beyond its immediate needs. In part, that problem is addressed by various arrangements that fund training. 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, native title, land access and usage, and noise levels and urban amenity. The regulations are typically coupled with requirements for community consultation and planning and 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. Australian governments are currently considering that study's wide-ranging recommendations for reform.

Reform can begin immediately and will produce large economic benefits

A central message from this draft report is that there is scope for individual governments to act immediately on many potential reforms. In a large proportion of cases, the necessary steps for reform are reasonably well understood, and any required coordination with other jurisdictions should not significantly delay action. There is a wide suite of reforms that can and should be initiated immediately:

- consideration of alternatives to infrastructure provision that achieve the same goals (for example, clearways to relieve congestion)
- improved project selection. Even election commitments to build and/or fund substantial infrastructure should be subject post-election to rigorous project assessment and selection. White elephants should become an endangered species, or at least a rare one not to be protected
- 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.[1]

- the development of greater procurement competencies
- a clearer idea about the pitfalls and lessons of different funding and financing models, which could avoid some of the mistakes of the past
- the adoption of procurement guidelines to provide incentives for better industrial relations arrangements
- pricing reform for those areas of infrastructure are already amenable to it, which would provide a revenue source for infrastructure funding, and provide a signal about where and when to make investment.

Moreover, 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.

Of course, while it is in governments' best interests to pursue these reforms, it can hardly be said that reform has proceeded either apace or uniformly throughout Australia. This is why the Commission has floated the idea that nationwide reform could be boosted though leverage from the Australian Government's large annual outlays of infrastructure funding for the states and territories.

[1] Proposals raised by some state governments that they receive compensation for lost tax equivalent payments are quite distinct from the critical efficiency issues. Nevertheless, the Commission will address the issues raised by these proposals in the final report.

Draft recommendations, findings and information requests

Provision, funding and financing

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

DRAFT FINDING 5.1

There is no shortage of private sector capital that could potentially be deployed to finance public infrastructure in Australia. Private capital markets will finance most projects at the 'right price'.

DRAFT FINDING 6.1

Where project selection decisions are consistent with recommendations made in this report, there is additional capacity for the Australian and State and Territory Governments to finance public infrastructure from their own balance sheets through the issue of sovereign debt and/or through tax.

INFORMATION REQUEST 3.1

The Commission seeks examples of where privately delivered public infrastructure project tender processes at the Australian Government or state or territory level have failed to meet the public sector comparator.

INFORMATION REQUEST 5.1

The Commission seeks feedback on the availability of bond finance for public infrastructure projects in Australia.

- *To what extent are there impediments to the development of the Australian bond market to support investment in infrastructure?*
- *To what extent are there barriers to Australian infrastructure firms accessing international bond markets?*

INFORMATION REQUEST 6.1

The Commission seeks views on the costs and benefits of governments issuing project-specific infrastructure bonds, with the interest rates reflecting the risks of the project and which explicitly do not have a government guarantee.

INFORMATION REQUEST 6.2

The Commission seeks views on the costs and benefits of governments issuing converting infrastructure bonds to finance greenfields infrastructure investments.

INFORMATION REQUEST 6.3

The Commission seeks feedback on the advantages and disadvantages of alternative procurement processes focused on long-term equity, such as an 'inverted bid' model. In particular, the Commission is interested in how an alternative procurement process should be designed to maximise efficiency gains and the likely benefits and costs of such an approach.

Better institutional and governance arrangements are crucial

DRAFT FINDING 7.1

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

DRAFT RECOMMENDATION 2.1

There is no continuing case for retention of certain infrastructure in public hands. Accordingly, State and Territory Governments should privatise their government-owned:

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

subject to appropriate processes to ensure value for money.

INFORMATION REQUEST 2.1

The Commission seeks views on other prospective infrastructure assets that the Commonwealth, States and Territories should consider for privatisation.

DRAFT RECOMMENDATION 7.1

Institutional arrangements for the provision and delivery of public infrastructure should incorporate good governance arrangements, including:

- ***the principal objective of ensuring that decisions are undertaken in the public interest***
- ***clear and transparent public infrastructure service standards***
- ***effective processes, procedures and policy guidelines for planning and selecting public infrastructure projects, including rigorous use of cost–benefit analysis and transparency in cost–benefit assessments, public consultation, and public reporting of the decision (including a transparent review of the decision by an independent body, for example, an auditor-general or Infrastructure Australia)***
- ***efficient allocation and monitoring of project risks between government and the private sector***
- ***use of transparent and competitive processes for the selection of private sector partners for the design, financing, construction, maintenance and/or operation of public infrastructure***
- ***sufficiently skilled employees who are responsible and accountable for performing their functions***
- ***principles and processes for considering funding arrangements, including application of user-charging as the default funding arrangement where this is appropriate, and transparency of funding decisions (including public reporting of decisions and periodic review by an independent body, for example, an auditor-general or Infrastructure Australia)***
- ***principles and processes for selecting efficient financing mechanisms and transparency of financing arrangements***
- ***performance reporting and independent evaluation of public infrastructure project performance.***

DRAFT FINDING 7.2

For the proposed reforms to institutional and governance arrangements (draft recommendation 7.1) 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 not politically expedient. The proof of that commitment lies in rejecting projects that have obvious 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.

DRAFT RECOMMENDATION 7.3

Australian Government funding or other forms of assistance (such as loans and government guarantees) for public infrastructure that is provided to local, State and Territory Governments should be conditional on the following:

- ***use of effective cost–benefit analysis and transparency of assessments including the methodology and assumptions***
- ***evidence of a demonstrable net public benefit from the project which is not obtainable without Australian Government support***
- ***evidence that competitive processes will be used for the selection of financing, design, construction, maintenance and operation of public infrastructure services where these tasks have been outsourced to the private sector***
- ***evidence that the relevant government has efficiently used opportunities for users and other beneficiaries to fund the infrastructure through measures such as user charges, betterment levies and property development charges***
- ***ex post evaluation and publication of public infrastructure project outcomes.***

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

All governments should be encouraged to apply the above principles and actions to their own-funded projects.

INFORMATION REQUEST 7.1

The Commission's current inclination is that the package of measures proposed in this report would be sufficient to constitute a 'pipeline' that would assist purchasers and tenderers in forward planning and to minimise costs. The Commission seeks views on the appropriate organisational framework to collect and disseminate information about a pipeline of projects and the extent to which private organisations should provide information about their plans to build significant infrastructure.

INFORMATION REQUEST 7.2

The Commission seeks further information from participants on the costs and benefits of land corridor and site preservation strategies. In particular, it seeks evidence on the effectiveness of current jurisdictional strategies and the merits of a national regime. It also seeks views on the optimal ways in which corridors and sites can be used prior to infrastructure developments.

Road-specific institutional and funding reforms are required

DRAFT RECOMMENDATION 7.2

All governments should take deliberate steps towards implementing institutional reforms in the road sector for cars and other light vehicles that improve project selection processes, facilitate greater adoption of direct user charging mechanisms, and more directly link road charge revenue with future spending on roads. The consideration of institutional reforms for cars and other light vehicles should take into account the current reforms being developed for heavy vehicles under the Heavy Vehicle Charging and Investment reform process.

The Commission considers that a road fund model should form the basis of starting a long-term transition to a more commercial approach to project selection and road provision for cars and other light vehicles. To be effective, the road fund needs to have access to adequate sources of funds, a significant degree of autonomy, and transparent processes for determining the level and allocation of funds.

Institutional and governance arrangements adopted should include a formal procedure for consultation with road users and the broader community, as well as systematic post-project evaluation and periodic review of the arrangements.

DRAFT 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 coordinate and share experiences; and ensure that motorists are consulted, potentially via roads and motorists associations. The pilot studies should be designed to inform future consideration of a (revenue-neutral) shift to direct user charging for cars and other light vehicles, with the revenue hypothecated to roads.

Reducing costs

Costs have risen, but due to many reasons

DRAFT FINDING 8.1

Aggregate data indicate that the costs of construction inputs, particularly labour, fuel and land, have risen substantially recently. 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.

Construction productivity and competition: an uncertain picture

INFORMATION REQUEST 9.1

The Commission seeks further information on the possible causes of the relative low levels of capital deepening in the construction sector, and whether or not the trends in productivity identified for the sector apply to infrastructure construction activities and whether these trends are likely to be long-lasting.

INFORMATION REQUEST 9.2

The Commission seeks further evidence on productivity levels and trends in major project construction. It also seeks further examples or case studies from Australia and overseas that illustrate productivity improving changes in construction methods, technologies or organisational structures.

INFORMATION REQUEST 10.1

The Commission seeks information on the degree to which construction businesses find it hard to access short-term finance to meet upfront construction costs of projects, the effects of this on competition (if any), and any policy measures that might be justified.

INFORMATION REQUEST 10.2

Given the lack of definitive evidence on the presence (or lack thereof) and use of market power, the Commission seeks more information on competition issues, including between Tier 1 contractors and with regard to the ease of entry by other contractors.

Planning and tendering arrangements can be significantly improved

DRAFT RECOMMENDATION 8.1

Given high and rising land costs in urban areas, 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. 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.

INFORMATION REQUEST 8.1

The Commission seeks more detailed information from participants about techniques used in other countries to deal with the issue of land reservation.

DRAFT RECOMMENDATION 11.1

Governments should invest more in the initial concept design specifications to help reduce bid costs, but in doing so, provide opportunities for tenderers to contest the specifications of the design.

DRAFT RECOMMENDATION 11.2

When tendering for major infrastructure work under design and construct arrangements, governments 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.

DRAFT RECOMMENDATION 11.3

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.

DRAFT RECOMMENDATION 11.4

The 'early contractor involvement model' should be trialled 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.

DRAFT RECOMMENDATION 11.5

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. Governments should give serious consideration to where in their better practice guides they may specify the use of BIM.

DRAFT RECOMMENDATION 11.6

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

DRAFT RECOMMENDATION 11.7

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

DRAFT RECOMMENDATION 11.8

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 by relatively smaller construction companies.

DRAFT RECOMMENDATION 11.9

Government clients should invest more 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. In order to achieve this, government clients should not rush to market.

INFORMATION REQUEST 11.1

The Commission seeks evidence on the skills of public sector clients to manage contracts for major infrastructure projects. Is there evidence that a relative lack of skills has led to systematic cost overruns during the delivery phase? How does this compare to the performance of private sector clients?

INFORMATION REQUEST 11.2

The Commission seeks evidence on the potential benefits of creating special-purpose agencies in each jurisdiction to conduct infrastructure procurement on behalf of government clients that do not frequently procure infrastructure or where combined purchases across a range of government might lead to savings.

INFORMATION REQUEST 11.3

The Commission seeks evidence on the appropriateness and effectiveness of the application of incentive payments within infrastructure contracts.

Industrial relations reforms can reduce some cost pressures

DRAFT FINDING 12.1

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. However, 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.

DRAFT RECOMMENDATION 12.1

All Australian governments should adopt the Victorian building code guidelines (or ones with an essentially similar framework) 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.

DRAFT RECOMMENDATION 12.2

The Australian Government should increase the ceiling of penalties for unlawful industrial relations conduct in the construction industry.

INFORMATION REQUEST 12.1

The Commission seeks information on the extent to which wages growth has exceeded productivity growth for non-dwelling construction and civil and heavy engineering construction activities.

INFORMATION REQUEST 12.2

The Commission seeks feedback on any alternative explanations of the differences in the growth rates of input costs between the dwelling and non-dwelling construction segments of the industry, and whether the patterns found for building construction have broader applicability to other forms of public infrastructure.

Better data collection and some reviews are required

DRAFT RECOMMENDATION 8.2

The Australian Government should fund the development and ongoing implementation of a detailed benchmarking framework for major infrastructure projects in Australia. 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, at a minimum, include information on tender costs and other procurement outcomes, completion times and final out-turn costs and levels of remuneration and industrial disputation.

The provision of data to support the benchmarking framework should be a requirement attaching to all Australian Government funding for major infrastructure projects. 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.

DRAFT FINDING 8.2

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.

INFORMATION REQUEST 8.2

The Commission seeks views on the best set of institutional arrangements to undertake its proposed benchmarking initiative, including roles that existing agencies might play (such as Infrastructure Australia, the Bureau of Infrastructure, Transport and Regional Economics, and the Australian Bureau of Statistics).

INFORMATION REQUEST 8.3

The Commission seeks further and better evidence on construction cost differentials for major infrastructure projects, both within Australia and between Australia and comparable countries.

INFORMATION REQUEST 13.1

The Commission seeks feedback on the effectiveness of the National Apprenticeships Program and whether it would be appropriate to extend the program to trades and employers in the infrastructure construction sector.

DRAFT RECOMMENDATION 13.1

The Australian Workforce and Productivity Agency should make and publish regular projections of labour demand from public infrastructure construction. Information collected and produced as part of the proposed benchmarking activities (draft recommendation 8.2) should support this activity, including data from all cost–benefit analyses undertaken for infrastructure projects that receive Commonwealth funding. The private sector and State and Territory Governments should be invited to participate in providing data pertaining to non-Commonwealth-funded projects.

DRAFT RECOMMENDATION 13.2

In a reformed partnership with key stakeholders, the administrators of training funds should review existing objectives, conditions and processes around funding allocation. The parties should agree on suitable guidelines that will be able to meet the current needs of industry, as well as their likely future needs in an environment where there is a more continuous flow of infrastructure investment.

DRAFT FINDING 13.1

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

DRAFT RECOMMENDATION 14.1

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.

1 Introduction

Key points

- This inquiry covers the provision, funding, and financing of major public infrastructure, and the scope for reducing infrastructure costs. While the emphasis is on economic infrastructure, major social infrastructure is also within scope.
- Over recent years, the provision of infrastructure has become an increasingly significant 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) equity, efficiency and productivity objectives.
- Efficient public infrastructure provides services that can improve productivity and quality of life. But poorly chosen infrastructure projects can reduce productivity, financially burden the community and crowd out more highly valued 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.
- Historically, governments have 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 claimed 'infrastructure deficit'; antipathy to using government debt to finance infrastructure; the potential for efficiency gains in delivery; 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 outcomes are not undermined in order to achieve perceived short-term benefits.
- Outcomes from the provision and delivery of public infrastructure have been mixed, and important lessons can be learned to prevent future mistakes.
- 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.
- A number of aspects of this draft report cover issues where the Commission is keen to obtain further evidence before making a final judgment.

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 before this inquiry, including by the COAG Reform Council (2012), Infrastructure Australia (2008d), and the Exports and Infrastructure Taskforce (2005). There are several drivers of this interest, including the widespread view that Australia has an 'infrastructure deficit' in areas like roads, rail and ports, and that this is holding back productivity growth 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 has not been confined to Australia. In the United Kingdom, some other European countries and Canada 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.

An important lesson from this experience is that what works in one infrastructure sector will 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 very complex.

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 associated with 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 terms of reference require the Commission to consider the provision, funding, financing and costs of public infrastructure projects within the category 'economic infrastructure'. They also refer to the terms 'major infrastructure projects' and 'nationally significant economic infrastructure'. These are not defined in the terms of reference and generally have different accepted meanings (box 1.1).

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* — the *Infrastructure Australia Act 2008* (Cwlth) defines nationally significant infrastructure 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 jurisdictions, and the Commission has previously noted (PC 2013c) 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).

What is considered 'public' infrastructure is complicated, particularly given the way the relationship between the government and the private sector has changed over time. The OECD (2002) defines infrastructure as 'the system of public works in a country, state or region, including roads, utility lines and public buildings'. 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 underprovision or no provision.

The scope of the inquiry covers economic infrastructure, including rail, roads and public transport, water and energy networks, ports and airports (box 1.1). However, social infrastructure (such as hospitals, prisons and educational facilities) has similarities to economic infrastructure in terms of planning arrangements, the decision to invest (driven by cost–benefit analysis and political decision-making processes), options for funding and financing mechanisms, contracting arrangements, the potential for cost and time overruns, and 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 & Regional Development, sub. 64; Office of the Infrastructure Coordinator, sub. 78; Victorian Government, sub. 81). Accordingly, this report also covers major social infrastructure.

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

'Provision' is used in this report to mean making the decision to provide the infrastructure. In contrast, 'delivery' is used to denote the method by which public infrastructure services are delivered to the community. 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. Possible sources of funding are direct user charges (such as tolls or volumetric charges), and value capture from charges on other beneficiaries or taxpayers in general (taxes on land, fuel excise and 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 economic infrastructure, which accounts for a significant portion of the nation's economic activity (box 1.2).

Box 1.2 Examples of Australia's stock of economic infrastructure

The data below are for 30 June 2011. In terms of transport assets, Australia had:

- 33 331 kilometres of railway track (includes passenger public transport)
- 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.

For energy (electricity and gas) assets, Australia had:

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

For water assets, Australia had:

- 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.

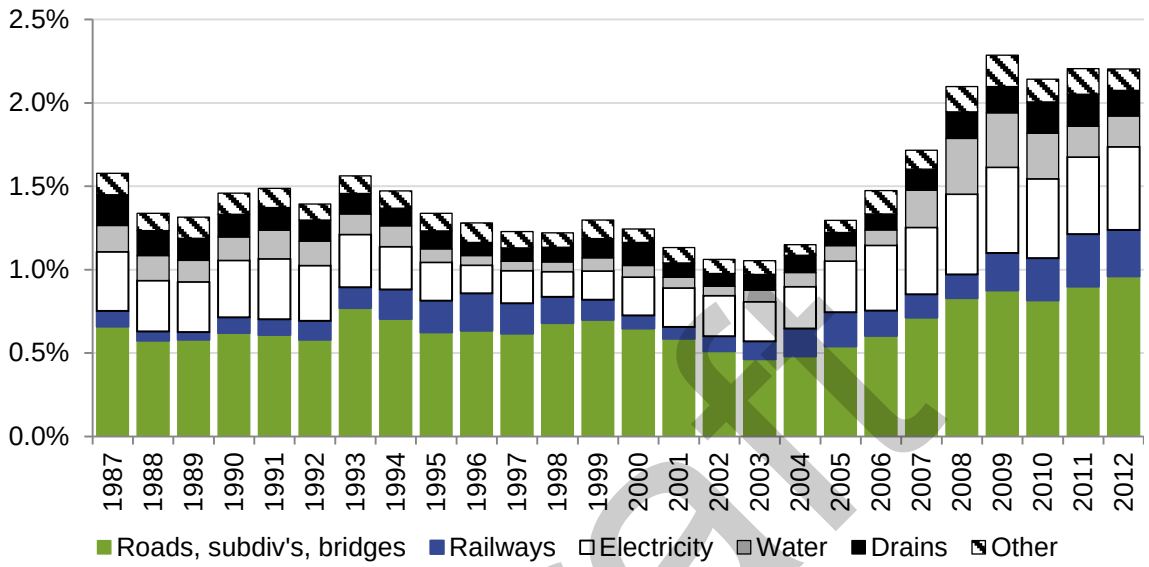
For communications infrastructure, Australia had over $14.4 billion of information and communications technology stock.

Source: adapted from BITRE (2013).

In 2011-12, Australia's major economic infrastructure industries (defined as: transport, postal and warehousing; energy; information media and telecommunications; and water supply and waste services) accounted for 10 per cent of gross domestic product (GDP) (BITRE 2013). Over the last decade, engineering construction work for the public sector (a rough proxy for investment in public infrastructure) increased, to reach slightly more than two per cent of GDP in 2012 (figure 1.1). This indicates that, if there is an 'infrastructure deficit', it is not

because of a fall in infrastructure investment. Roads and related infrastructure accounted for about 43 per cent of the total in 2012 (figure 1.1).

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



a Engineering work done for the public sector by government agencies and the private sector, excluding the construction of buildings. Projects are classified as being for the public sector according to expected ownership at the time of completion. This can cause projects undertaken as public private partnerships to be classified as being for the private sector even though ownership eventually resides with the public sector. The data in the diagram do not include 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). The 'other' category includes engineering work for: airports; harbours; and pipelines.

Source: ABS (2013) *Engineering Construction Activity, Australia*, cat. no. 8762.0.

Australia's stock of social infrastructure is also large and diverse (box 1.3).

Box 1.3 **Examples of Australia's stock of social infrastructure**

- Australia had 753 public hospitals (including 17 psychiatric hospitals) in 2011-12. Total recurrent expenditure by Australian, State and Territory Governments on public hospitals (excluding depreciation) was $40.4 billion in 2011-12.
- Australia had 6697 government schools and 2730 non-government schools in 2012, and the (written-down) value of the capital stock for all government schools in Australia was $70.6 billion (in 2011-12).
- There were 113 correctional custodial facilities in Australia in 2013, of which 85 were government-operated prisons. National net operating expenditure on corrective services (including depreciation) was $3.2 billion in 2012-13.

Source: PC (2014b).

Responsibilities for public infrastructure

All levels of government are involved in providing public infrastructure, but the nature and extent of their responsibilities varies between jurisdictions and across different types of infrastructure (table 1.1). While State and Territory Governments are responsible for most types of public infrastructure, the Australian Government has a role in 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 1.1 **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 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
- rail systems built in the last century 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 general policy and regulatory functions (box 1.4), 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). Consumers 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 Liquified Natural Gas project, which includes construction of a LNG plant, a jetty for transport to international markets, and a domestic gas plant and pipeline for domestic supply (PC 2013c). 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 such infrastructure and not discourage or crowd it out.

Public infrastructure is different to most other goods and services in the market. In many cases, governments have taken on the role of lead infrastructure provider for equity reasons, because there is a market failure, or sometimes for historical or cultural reasons.

Equitable access has long been one of the main reasons why governments, rather than the private sector, provide infrastructure. Markets may not provide equitable access to a basic quality of service (for example, water, sewerage, roads, rail and telecommunications) to groups that are less able to pay or are more costly to supply (such as rural communities). As such, governments have often taken a lead role in particular sectors to ensure basic services are provided.

Box 1.4 Governments' policy and regulatory functions

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 providers (for example, for construction services) and appropriately regulate market power
- 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 providers 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.

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 under-provide 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. In particular, *network externalities* can occur when the overall returns of infrastructure investments depend on whether investment choices are coordinated. For example, the benefits of constructing a highway will be increased if the local road network is integrated with the highway. In such cases, the overall benefits of such a road network will be greater than if the roads were built without regard to the highway, and the overall benefits of the highway will be greater than if it were built without regard to the road network (Giacinto, Micucci and Montanaro 2012).

There are also other types of externalities of particular relevance to public infrastructure. For example, *agglomeration economies* are a positive externality, which occur when a range of businesses are located in the same area and are able to share non-excludable inputs to production (such as a road network). Sharing the road network will lower the cost of that input to each individual business (Eberts and McMillen 1999).

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 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.

Historical development of private sector involvement

Historically, governments have taken responsibility for most aspects of infrastructure provision because of equity considerations and market failures. However, this does not mean that the government must also take responsibility for

delivering the infrastructure. In practice, a wide variety of delivery models have been used, many of them involving the private sector. In part, this 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.

Methods 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.

One form of contracting model is known as traditional procurement, where the government finances and owns the infrastructure, but contracts with private firms for its design, construction and maintenance. Alternatively, there are various types of public private partnerships (PPPs). Generally speaking, a PPP can be defined as a contract between the public and private sectors that involves private financing and where a private party delivers and owns infrastructure and provides associated services over the long term. In either case, funding can come from private sources (that is, user charges), tax revenue, or a combination of the two. Where user charges generate a commercial rate of return, there can be purely private provision.

However, 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 airports, the national airline, the Moomba-Sydney and some other gas pipelines, Australian National Rail, various electricity 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 and can disadvantage further efforts at privatisation. 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 between jurisdictions and between different types of infrastructure. For example, governments are generally responsible for funding, financing and owning road infrastructure. By contrast, private sector ownership is feasible for most electricity, airport and port assets, given that it is possible to identify and charge users. 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 provision of infrastructure has been argued to improve timeliness, cost and availability of new infrastructure, as well as promoting efficient operation of existing infrastructure compared with public operation. For example, many have argued that one of the 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). However, in principle, the choice of delivery model should be based on which model provides the best value for money to the community.

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. It might be appropriate for a government to accept risks that are too widely dispersed for the private sector to manage effectively — for example, this might apply for some large greenfields projects with uncertain demand. 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. Based on the consultation undertaken by the Commission, the main drivers of this appear to be as follows. 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 the costs of businesses using the service delivered by the infrastructure, directly lowering productivity. These bottlenecks can arise from, for example, population growth, which is 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) that are 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, Citigroup (2008) estimated that required infrastructure investment in the decade to 2018 would cost more than $770 billion, and Infrastructure Australia estimated that the deficit was in the order of $300 billion (IA 2013a). Many inquiry participants endorsed the notion that there was a substantial infrastructure deficit, and some also provided estimates of its size (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).

Although these arguments are evidence of substantial community interest in infrastructure, and its importance to productivity and the quality of life within urban areas, 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 sometimes possible to improve utilisation of existing infrastructure — for example, congestion charging for roads in peak periods can reduce congestion by reducing demand. Another solution could be allowing a wider ability for private provision of infrastructure, with the government role confined to matters such as land acquisition and land-use planning.

Determining the most welfare-enhancing level of infrastructure 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 a self-imposed debt limit, 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 the 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.

In such cases, there is a tradeoff as to whether the acceptance of a lower credit rating and a higher price of future debt is worthwhile in order to provide investment capital for public infrastructure that enhances community welfare. Such a tradeoff needs to be handled transparently, and the community needs to be provided with full information in order to assess the wisdom of the tradeoff, as they will ultimately bear the cost of poor decisions.

A related development is interest in the concept that existing infrastructure can be 'recycled' to provide a source of finance for new infrastructure, thereby reducing the requirement to borrow. While there may be sound arguments in favour of capital recycling, it involves two decisions that should be considered independently. First, whether a government-owned asset should be sold, and second whether the government should procure new infrastructure. Careful analysis of individual privatisation and purchasing proposals is essential.

New opportunities for user charging

Where a government is looking to fund infrastructure, the availability of user charges can enable private provision and/or operation of infrastructure. Technological developments are making it increasingly cost-effective to charge end users directly in areas such as roads. This allows some of the public good characteristics of roads, such as the difficulty of excluding people unless they pay, to be diminished.

Perhaps understandably, policy makers have been reluctant to adopt user charging in some areas, particularly road transport. Tolls are not welcomed by the

community in an environment where the long-term model of service provision is to fund 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 difficult, both practically and politically.

It has been suggested that an important role of this inquiry is to communicate the value to consumers of more transparent and direct charges, which could replace current indirect charges (such as 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 of falling mining investment (The Urban Development Institute of Australia, sub. 40). It is argued that investment in public infrastructure could provide macroeconomic stimulus (either nationally or regionally) by using investment in public infrastructure to offset the macroeconomic consequences of the winding down of the mining boom or contraction of sectors such as manufacturing.

However, 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 are 'long lived' 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. But the overarching interest should be in effective planning and forecasting, 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 in the long term. Again, the focus should be on effective 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 in providing and delivering 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 the delivery of public infrastructure follow.

- Despite some concerns about the level of concessions provided by the Victorian Government to Transurban, the Melbourne City Link 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 community, which in the end acquired the motorway for much less than its actual cost. However, this and other private sector failures may have contributed to an unwillingness by private parties to take on greenfield patronage risk in subsequent projects, thereby limiting future investment options (appendix B).
- The NSW Government bore significant financial costs from the Sydney Airport Rail Link after the company that built and operated the link failed to meet scheduled payments to creditors. Effectively this resulted in the government stepping in and assuming risks that were contractually assigned to the private sector.

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 Ord River Irrigation Scheme.

Governments are inevitably exposed to pressures to invest in infrastructure projects that may not be in the long-term interests of the community. 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, which can lead to both poor project selection and inflated prices (with bidders viewing the initial costing as a minimum figure).

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 is to seek to identify practical improvements that can be made in the provision, funding, financing and cost of public infrastructure, rather than to advocate wholesale change over a short period. This is generally consistent with the views expressed in submissions to the inquiry. Infrastructure is long-lived and the consequences of poor decisions in an environment of radical change might be felt for a long time. In some cases, the draft recommendations involve making use of new opportunities for improvement that have arisen as markets have matured, private sector capabilities have expanded and innovative ways to address market failures have developed. 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 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 1.5.

Box 1.5 **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. 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

While under-provision 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 — providing lower net benefits (or even net costs) to the community compared with alternative infrastructure projects that were foregone.

Because of this, the Commission's approach is to pay 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 is to consider the full range of options. In line with the terms of reference, particular attention is given to options for greater private sector financing and funding, and how to overcome barriers to their use.

In addition, the roles of the Australian Government, the States and Territories and Local Government are 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 areas that are important in creating a positive environment for investment in the economy generally (box 1.4). Although it is beyond the scope of this inquiry to consider all of these areas in detail, aspects of them are 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, 2013b, 2013c).

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 is 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.

In preparing the draft report, the Commission consulted and invited participation from interested parties in the following 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 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.
- The Commission met with a wide range of stakeholders, and held a roundtable in Melbourne on 19 December 2013.

A total of 109 submissions have been received since the issues paper was published. Appendix A provides details of the individuals and organisations that have participated in the inquiry to date.

Interested parties are invited to provide feedback on this draft report through further written submissions (due 4 April) and at public hearings to be held in April 2014. The draft report contains a number of information requests on issues that the Commission is particularly keen to obtain further evidence on. The final report will be submitted to the Australian Government in May 2014, and subsequently published.

1.7 Guide to the draft report

This draft report comprises two volumes.

Volume 1

The current chapter presents relevant background information and definitions, the Commission's overall framework applied in this inquiry, and the rationale for government involvement in public infrastructure. 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. Mechanisms to access the benefits of private sector involvement in the funding and financing of public infrastructure is discussed in chapter 3. Broad principles for choosing between various funding mechanisms, and impediments to the adoption of different funding models, are presented in chapter 4. The ways in which finance can be raised are discussed in chapter 5 and an examination of the

efficiency of different financing mechanisms, and barriers to private sector financing is undertaken in chapter 6. The scope for changes in institutional and governance arrangements to improve outcomes in the provision and procurement of public infrastructure is examined in chapter 7. This chapter also addresses coordination between governments, including the merits of alternative models for Commonwealth involvement.

Volume 2

Volume 2 considers the scope for reducing the cost of public infrastructure. Chapter 8 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 9. Concentration in the market for large infrastructure projects may affect competition, input costs and tender prices (chapter 10). Different tendering and contracting arrangements may have significant impacts on cost and time overruns, as well as the quality of projects (chapter 11). Industrial relations arrangements have often been seen as influential in affecting productivity, costs and conduct by unions and contractors (chapter 12). Chapter 13 examines the effect of skills shortages on construction costs, and governmental policy initiatives to address them. Chapter 14 explores planning and regulatory impediments to the efficient construction of public infrastructure.

Appendix B examines a range of public infrastructure projects from Australia and overseas. These case studies cover a range of different delivery models and infrastructure sectors.

2 Efficient provision

Key points

- Selecting the right projects (provision) 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.
- When properly conducted, cost–benefit analysis is a useful tool for guiding project selection and improving the transparency of decision making.
- 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 allow a broad range of costs and benefits to be appropriately taken into account. However, they can also 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.
- 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 in large part on the policy and regulatory frameworks put in place by governments. There are examples where private provision has worked well.
- It is in the public interest to privatise some further public infrastructure businesses, including in the energy and ports sectors, provided this is undertaken appropriately.
- Privatisation removes the need for governments to have an ongoing role in the provision and financing of some types of public infrastructure.
- Some public infrastructure businesses have been corporatised. This can lead to more efficient project selection; however:
  - this can be undermined by government involvement in managerial decisions
  - incentives for efficiency are not as strong as for private firms.
- Corporatisation and privatisation are generally only feasible where funding is predominantly through direct user charges. Where user charging is not practical or desirable, 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.

This inquiry is about the provision, funding, financing and costs of public infrastructure. Provision, the subject of this chapter, is the decision that resources should be allocated to a particular project. This process of 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, before focusing on two areas that are important for achieving efficient outcomes. First, the role that cost–benefit analysis can play in improving project selection and making decisions more transparent. Second, the importance of the institutional arrangements that give rise to the selection of projects. 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.

2.1 The importance of project selection

Project selection for public infrastructure is often initially undertaken before consideration is given to funding and financing. It encompasses a range of decisions, including:

- that a major investment in infrastructure is required (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, but then varied in response to new information. For example, a project might be modified or abandoned before the final decision to proceed if detailed scoping shows that costs are likely to be much higher than originally thought. 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.

Participants' views

There is considerable international and Australian evidence that shows the importance of project selection, and the high costs to the community from poor

choices. The importance of project selection was emphasised by a number of inquiry participants. 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)

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 contended:

> 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)

Other evidence

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. The unnecessary costs associated with this were not all 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 can be many and varied. In the case of urban water, unclear roles and responsibilities, policy prohibitions on particular supply options, deficiencies in analysis of options and grants/subsidies provided by governments were involved (PC 2011a).

In the case of electricity networks, the Commission has found that regulated reliability standards were mostly too high, and that this required network businesses 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 2013b)

There is also evidence that the selection of transport projects is sometimes deficient due to poor planning, and inaccurate demand and cost forecasts (appendix B).

Finally, there are examples where large public infrastructure projects have been approved without thorough 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 2.1).

2.2 The role of cost–benefit analysis

As discussed in chapter 1, cost–benefit analysis can be used to assess whether a proposed public infrastructure project is likely to provide positive net benefits to the community. Different 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.

Box 2.1 Genesis of the National Broadband Network project

In May 2007, the then federal opposition leader, Hon. Kevin Rudd MP, 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 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 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 the 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 states that it does 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)

The current Australian Government commissioned a strategic review of the NBN in 2013. This review 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).

Accordingly, cost–benefit analysis can play an important role in project selection, provided it is properly applied. 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 the consequence of different estimates to the project's net benefits to be calculated.

About cost–benefit analysis

Cost–benefit analysis involves aggregating impacts on all members of the community and appropriately taking account of risks (box 2.2). Discounting of future costs and benefits to the present is used to account for people's preferences to receive benefits now rather than later. To provide a reliable guide to what is in the communities' overall interest, cost–benefit analysis needs to be broad, taking into account economic, social and environmental outcomes. However, cost–benefit analysis does not usually incorporate distributional (or equity) considerations, and so judgments about the need for a response to distributional issues (such as whether any groups that are left worse off by the project should be compensated) are left to decision makers, ideally following community debate.

Cost–benefit analysis also 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. Cost–benefit analysis, which is usually undertaken by (or for) governments, is used to calculate net benefits from a community-wide perspective, thus it looks at the national interest rather than the interests of individual groups or sectors of the economy.

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.

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)

Box 2.2 What is cost–benefit analysis?

Cost–benefit analysis is a method that can be used to evaluate whether an infrastructure project (or a policy) makes the community better off overall, compared to the status quo (or some other alternative). That is, whether it is expected to produce a 'net benefit', and if so, the extent to which benefits exceed costs. This evaluation should be broad, taking into account economic, social and environmental outcomes.

In cost–benefit analysis, benefits are valued according to the willingness of individuals to pay for them, which can be more than they would actually need to pay for a given quantity. For example, the price of the water supplied to a household is often less than willingness to pay. Similarly, costs are valued according to the willingness of others to pay for the resources involved and, therefore, reflect the best alternative forgone (this is called 'opportunity cost').

A financial analysis only takes into account the market price (and total revenue) of supplying the service relative to its cost of production. A cost–benefit analysis takes into account the value of the service to consumers beyond the price paid, and the cost beyond what is paid to the factors of production. A cost–benefit analysis should also take into account any externalities — other costs and benefits — that fall on people outside those involved in the transaction.

Some externalities, such as effects on the environment or social amenity, are difficult to value. There are various methods that can be used to value such effects, or alternatively their importance can be discussed in qualitative terms.

The costs and benefits of projects and policies often accrue over a considerable length of time. To take account of people's preference to receive benefits now rather than later, future values are discounted to a present value. The choice of discount rate can be contentious, but government guidelines often dictate the rate (or range of rates) to be used.

Usually, costs and benefits are aggregated across individuals without regard to winners and losers from the policy. Governments and others may be concerned about how particular groups, such as low-income households or rural communities, are affected, and so may not think it appropriate to base decisions purely on a cost–benefit rule. Such distributional (or equity) concerns can be addressed in cost–benefit analysis by presenting disaggregated results showing the effects on particular groups. Decision makers can then make judgments about the need for any particular response to equity issues.

Source: Baker and Ruting (2014).

Three of the key aspects are considered below.

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)

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)

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.

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. (2013b, p. 34)

While these technical approaches are useful for countering optimism bias, unrealistic cost and demand forecasts also arise due to strategic misrepresentation. That is, proponents of a project wish it to proceed and so seek to make it appear better than it really is. While 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 2013b). Accordingly, attention also needs to be given to the institutional and governance arrangements within which analyses are done (discussed later).

Appropriate treatment of risk and uncertainty

As indicated, appropriate treatment of risk in cost–benefit analysis is necessary to counter optimism bias. In essence, 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. Ad hoc approaches, such as using a higher discount rate to counter over-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 worth investigating.

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 is entirely valid, and it is useful to keep appropriate options to rescale a project open when a re-assessment of the scope of the project 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).

Without diminishing the validity of the above, the Commission does acknowledge, 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.

Cautious and consistent treatment of 'wider economic benefits'

Infrastructure projects create direct benefits for subsequent users of the services provided using that 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'. 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. Conceptually, 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 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.

Is cost–benefit analysis enough?

The Commission recognises the importance of well conducted and transparent cost–benefit analyses and advocates it playing an enhanced role in project selection where a government is the decision maker. However, it needs to be recognised that estimates of costs and benefits for public infrastructure projects have often proven to have been overly optimistic in the past.

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 2.3). Flyvbjerg (2009, p. 353) concludes that 'it is not the best projects that get implemented, but the projects that look best on paper'. And that these are the projects with the largest cost underestimates and benefit overestimates.

Box 2.3 ***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 overrun, 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 on the inaccuracy in 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.

Source: Flyvbjerg (2009).

In an Australian context, the WA Auditor General found that actual costs for a sample of 20 major projects in Western Australia 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. This suggests that many of these projects were approved based on inaccurate information. The Auditor General also 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).

Improved expertise and guidelines for conducting cost–benefit analyses would go some way towards addressing these types of deficiencies. However, the institutional and governance arrangements within which project proposals are analysed and decided upon are also important, for example, to ensure transparency. There also needs to be a systematic review and analysis of completed projects (both through their development and after their implementation) to build the evidence base for better project selection over time.

2.3 Alternative institutional and governance arrangements

The importance of institutional and governance arrangements is widely recognised. For example, Dr Philip Lowe, the Deputy Governor of the Reserve Bank of Australia, identified governance arrangements for project selection as one of the three infrastructure challenges that he chose to highlight in a recent speech (Lowe 2013).

There are various types of institutional and governance arrangements that can be used for project selection for major 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 a government as the entity that selects projects vary in their make-up. However, they generally 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 its Minister(s). Ministers may also put forward project proposals for development by their departments.

Ministers then 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 Commonwealth'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 Commonwealth on 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 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
- decisions being driven by political considerations rather than by economic merit
- a relative bias towards short-term project selection rather than careful and systematic analysis of longer-term needs and trends
- preference being given to icon 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 (for example, a government may see an advantage in announcing a project to address a recognised problem, and then be 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.

Private sector

Over the last three decades some public infrastructure has been privatised, including in areas such as electricity, gas, airports and ports. Where this has occurred, it is often the privatised firms that then 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. 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 2.4).

As discussed earlier, private sector investment is generally based on an analysis of the expected net benefits that will accrue to the firm concerned. Due to the existence of market failures and equity issues (discussed in chapter 1), such investment decisions may not align with what is in the public interest. 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 (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)

Box 2.4 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 in 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 will usually be able to 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, occasional electricity outages may be preferable to incurring the costs needed for 'failsafe' supply). Some aspects of efficient operation are described below.

- Improving the productivity with which infrastructure is used can reduce or delay the need for new investment. For example, increasing the number of crane movements per hour at sea ports (as has occurred in Australia in recent decades (PC 2007)) can increase their capacity.
- 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. The Commission has previously recommended time-based pricing and other reforms that would defer costly investment and ease price pressures on customers (PC 2013b).
- 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'.

Some commentators have argued that the public sector often does not fully exploit opportunities to more efficiently operate existing infrastructure 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)

- 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 2013b)
- regulatory price setting can entail firms only being able to recover costs for investments that the regulator regards as being efficient, and so the regulators view can influence which investments are made

- third-party access regulations can influence investment decisions by setting 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 regulation 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 2013b), 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 such as airports, 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 effects on investment)
- it is important to get structural arrangements right prior to privatisation (for example, separating natural monopoly components (such as electricity networks) from potentially competitive components (such as electricity generation)).

On this 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).

While 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 2013b). 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 2013b, 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 Corporations Law. Where Corporations Law 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 to influence directors. Some GTEs that are not subject to Corporations Law have governance frameworks that place similar duties on directors.

The potential benefits in moving from government provision to GTE provision can be somewhat similar to those from privatisation. It can create incentives and accountabilities for efficient project selection, and for reducing costs and creating

customer value. However, the profit motive does not operate in the same way as for private firms, there is no threat of takeover and the board is 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 provision. For example, governments have been known to extract 'special dividends', which can compromise long-term investment by the GTE.

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 the potential for ministerial, political and policy intervention. 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.

The Commission has examined these issues in sector-specific inquiries, including on urban water (PC 2011a) and electricity networks (PC 2013b). 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 publically disclosed
- non-commercial functions undertaken by GTEs should be funded by governments through community service obligation payments
- dividend payments to governments should, over time, provide 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.

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

2.4 Reforming institutional arrangements

It follows from the above discussion that there may be advantages in altering the institutional arrangements for some sectors, from ones that involve governments making decisions about which public infrastructure projects proceed, to ones 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.

In the Commission's view, there is sufficient evidence from past inquiries and reviews that there are a range of reforms that, if undertaken appropriately, would be in the public interest. These include privatising electricity generation, network and retail businesses, and major ports.

DRAFT RECOMMENDATION 2.1

There is no continuing case for retention of certain infrastructure in public hands. Accordingly, State and Territory Governments should privatise their government-owned:

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

subject to appropriate processes to ensure value for money.

INFORMATION REQUEST 2.1

The Commission seeks views on other prospective infrastructure assets that the Commonwealth, States and Territories should consider for privatisation.

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; Business Council of Australia, 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 (capital recycling is considered further in chapter 6).

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 possible that if more extensive direct user charging were introduced to a sector (such as roads), it may become feasible to implement elements of corporatisation, along the lines that exist in regulated utility sectors. This issue is considered in chapter 7 (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 that continue to have governments as the provider. This includes arrangements within each government and coordination between governments (such as the arrangements under which the Australian Government provides funds for public infrastructure to State and Territory Governments). Chapter 7 also examines these issues.

3 Achieving benefits from private sector involvement

Key points

- The overarching motivation for involving the private sector in the delivery of public infrastructure is to improve the efficiency of delivering services 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 services, provided 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 one-size-fits-all 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.
  - Risk allocation arrangements are most efficient when risks are credibly allocated to the contractual party best able to manage and price them and when rights and responsibilities to manage risks are allocated clearly. Expectations of bearing no or minimal risk is not conducive to an effective risk-allocation process.
- In practice, however, 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, authorities need to be able to understand risks and choose appropriate delivery models and contractual arrangements that appropriately and credibly allocate risks. Approaches to improve arrangements in these areas are discussed in the following chapters.

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. As noted in chapter 1, government involvement has been driven in part by a desire to achieve an equitable level of access to public infrastructure services. Governments have also provided public infrastructure because the characteristics of such infrastructure (natural monopolies, public goods and externalities) would in many cases result in under provision or no provision if investment and service delivery were left solely to the private sector. This is particularly the case with respect to some greenfield infrastructure projects, such as for some toll road projects that involve greenfield patronage risk.

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 sector 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 for the private sector to more efficiently build and operate some infrastructure and to better manage the associated risks.

In Australia, governments generally do not undertake construction of major public infrastructure, with their (diminishing) construction activity now largely limited to smaller projects. Governments now sometimes bundle the design, construction, maintenance, financing and operation of some infrastructure services through public private partnerships (PPPs).[2] This has been partly facilitated by technological changes that have allowed wider implementation of user charging models. Pro-competitive reforms (and the associated development of markets for 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 higher 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 project to project and from sector to sector.

2 The concept of using the private sector to provide public infrastructure is not new. For example, there is evidence of contracts between consortia of city-states in Lebadeia in Boeotia, Greece and private contractors for the construction of the Temple of Zeus Basileus in the fourth century BCE (Dr. Robert Pitt, pers. comm, 4 November 2013).

The purpose of this chapter is to outline broad principles that are 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.

Allocating risks to the private sector 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, 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 seeking to 'buy certainty'. More detail on the consequences of risk allocation arrangements, particularly as they relate to financing (chapters 5 and 6) and tendering and contracting (chapter 11) are discussed in the following chapters. 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 chapter 7.

3.1 The various models of public infrastructure provision

There are various models of public infrastructure provision, ranging from traditional procurement (construction contracting, alliancing and managing contractor models), PPPs, and private provision (with or without economic regulation). There are also a number of models within these three broad forms of provision, as well as common variations to each model and hybrids of models (box 3.1). Further details on the types of contracting models are provided in chapter 11.

Delivery models vary in their level of private sector involvement but both traditional construction contracting and PPPs typically involve the private sector. For example, under design and construct, the government may specify the quantity and quality of the infrastructure service, 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 the private sector may be responsible for the design, construction, finance, operation, maintenance and commercial risks associated with the infrastructure service and may own the asset before it is transferred back to the government after an agreed period.

Box 3.1 **Forms of public infrastructure provision**

- **Construct only** — government retains responsibility for the design of the infrastructure and contracts the private sector (through a tender process or other processes) to construct the facility.
- **Design and construct/maintain** — government contracts a private party to design (based on a design brief from government) and construct an infrastructure service and may also contract 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** — PPPs 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. PPPs generally include private financing where the private party is set up 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 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. Other PPP models are also used, including build-own-operate (BOO) and build-own-operate-transfer (BOOT). 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.
- **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).

As discussed in chapter 2, 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). These models exist in a number of

sectors including electricity, gas, water, ports and airports. 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 prices, investment and service outcomes are as efficient as possible. This helps to militate against such factors as monopoly pricing.

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 (chapter 1), such as for roads and public transport, and where public infrastructure is provided to meet the equity objectives 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 sector financing of the upfront investment costs.

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) 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 private sector involvement 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 more 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. 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 relatively stronger incentives to reduce costs and to operate efficiently, partly driven by shareholder pressure for performance and accountability and the pursuit of profit. As an example, the Commission noted in its inquiry into electricity network regulation that the evidence in Australia and internationally suggests that private sector electricity network enterprises are more efficient than public sector equivalents (PC 2013b).

Responsibility, accountability and incentives to manage infrastructure services efficiently are more diffuse within the public sector and may sometimes operate in the opposite direction. 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 have shorter election cycles and budget horizons (around three to four years).

Bundling and contracting out the design, construction, maintenance and operation of public infrastructure services (as sometimes occurs under PPPs) 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 (although there may be cost and quality tradeoffs to be taken into account during contracting (Hart 2003) as well as issues associated with reinvestment and maintenance in the final years of the contract). 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 strong implications for the costs of maintenance of the facility in later years.

Some studies that have attempted to quantify the efficiency benefits associated with PPPs have found that PPPs outperform other forms of public infrastructure procurement in terms of time and costs of construction (box 3.2). However, these studies do not enable a complete comparison of the efficiency benefits of PPPs. 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).

Box 3.2 Some reported efficiency benefits of PPPs

Some studies have found that PPPs outperform other forms of public infrastructure procurement during the construction phase of infrastructure projects. Three are listed 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 overrun because contracting and financing tends to be more complex. However, 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, 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.

Some others also point to a lack of 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.

Predictability and transparency of costs

Some PPPs involve private sector financing. Private finance 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).

As discussed in chapter 2, optimism bias is a demonstrated systematic tendency for project appraisers to be over–optimistic about key project parameters. 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 consequences if significantly miscalculated.

The due diligence role played by private financiers may also add value in mitigating risk and incentivising performance (BCA, sub. 39; Victorian Government, sub. 81). For example, Engel, Fischer and Galetovic (2010) suggest that banks perform a monitoring role that is well suited to mitigating moral hazard during the construction phase 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 play a role in monitoring events that may significantly affect the revenues (and hence returns) of the infrastructure service. The extent to which this occurs will depend on the structure of the finance and whether project finance or corporate finance is involved (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.

Alleviation of pressure on government budgets

Another perceived benefit of private sector financing is that it alleviates pressure on government budgets due to the unwillingness of governments to raise taxes (or reduce expenditure) or increase public sector borrowing to finance public infrastructure. However, as outlined below, this can only be so if the expectations for proposed projects are that over the life of the project, revenues from user charges would be sufficient to recover the total costs of the project, including an appropriate risk-adjusted return on capital.

A PPP may involve the private sector financing the upfront investment cost of the project, rather than being financed by government. However, depending on the PPP model, the upfront financing cost is either repaid through direct user charges (for example, tolls on a toll road under a concession model) or by taxpayers through government payments to the private firm over the life of the project (for example, under an availability payment model for a road). Although long-term funding by governments via payments to the private party do not show up on the government's balance sheet as debt, the payments impose a long-term non-contingent liability on governments similar in effect to public sector borrowing (de Bettignies and Ross 2004; Yescombe 2007). In such circumstances there are fiscal effects.

Thus, although PPPs offer scope to alter the timing of government payments to fund infrastructure services, they do not necessarily alter the intertemporal effects on government budgets (setting aside the efficiency gains). These issues and the merits of using availability payments are discussed in further detail in chapter 6, which also discusses the effects of privatisation on government budgets.

Competition and innovation

Although there will often be only one provider of a public infrastructure service (chapter 1), 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 and obviate the need for economic regulation when there is only one provider of the service (PC 2014a). Where there is more than one provider of an infrastructure service, facilities-based competition may provide a market-driven solution to a lack of effective competition due to natural monopoly.

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 10 and 11.

Potential challenges of private sector involvement

Principal-agent problems

Investments in 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 sector 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. Equally 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 also be thought of as a repeated game, which can be influenced by the level of trust between the client and the private contractor.

Higher costs of finance

As noted above, PPPs often include private financing. An argument against private sector financing is that the private sector's cost of finance is higher than governments' cost of borrowing. Governments are able to borrow at lower rates than private companies, in part because they can increase taxes to repay lenders and this is factored into their credit risk. However, the appropriate cost of finance for a project depends on a project's risk, which the private sector will explicitly price into their cost of finance for the risks they take on. Although these risks may not be adequately factored into the government's cost of finance, they do not disappear when government finances a project. Instead, they are transferred to the broader community (taxpayers). Risks do not disappear (they just get managed better or worse) and neither do costs disappear (they are just relatively higher or lower).

Another argument that supports a lower cost of finance for government is that the government is able to spread risks over millions of taxpayers. At the extreme, this would suggest that government is better placed to finance all projects in the economy. However, the private sector is also well able to diversify risk among a large number of shareholders (directly through a large number of project financiers or through investment or superannuation funds across the world) who in turn diversify their risks by owning a range of investments (Irwin 2007; Yescombe 2007). By contrast, the government's taxation revenue is highly correlated to the domestic economy rather than the international economy.

Higher transaction costs

Some delivery models (particularly PPPs based on project financing) involve highly complex negotiation, due diligence and contractual arrangements, which contribute to higher 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 Australia's transaction costs are higher than in the rest of the world. For example, the Infrastructure Finance Working Group (IFWG 2012, p. 23) 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. 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 differences in information requirements, and the need for fully costed solutions supported by detailed information on design, construction, maintenance and financing.

Given the complexity of PPPs, many countries have established specialist PPP units aimed at reducing transaction costs. Over one–half of OECD countries report the existence of a dedicated PPP unit of some kind, and Partnerships Victoria has administered Victoria's PPP contracts since 2000. Further, efforts to reduce complexity and increase uniformity of approach were also a key reason behind COAG endorsing National PPP Guidelines in 2008.

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 face no (or limited) alternative use. Operating contracts may also extend for many years. Governments may want to retain flexibility to change 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. For instance, government may include an option to vary the contract under certain circumstances (and agree to pay the private party if the option is exercised). However, it is not possible to design contracts perfectly and contract flexibility may affect the allocation of risk and, indeed, the nature of risk. The private party may carry more risk if the contract is flexible, whereas the public sector may carry more risk (a loss of 'option value') if the contract is rigid. Of course, the private party will more likely be willing to take on additional risk if the government is willing to pay it to do so (Burger and Hawkesworth 2011). Nevertheless, 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.

To the extent that the risks are unknown or unquantifiable, a risk-averse government could be paying a large premium to protect against a 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 will be higher.

Realising net benefits from private sector involvement in the delivery of public infrastructure services is challenging and involves complex decisions about investment and the allocation of project risks. While 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. In practice, outcomes have been mixed (some examples are provided later in this chapter and in appendix B). Having a capacity among government agencies that have the ongoing ability to learn from these experiences is important (chapters 7 and 11).

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 analysis used to establish the case for a public infrastructure project may 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 what model of infrastructure service provision 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 one-size-fits-all approach to determining the most appropriate delivery model for public infrastructure. Sectoral differences may mean that models of private sector involvement that best serve the community's interests in one sector may not be optimal 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 most value for money (box 3.3).

Box 3.3 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:

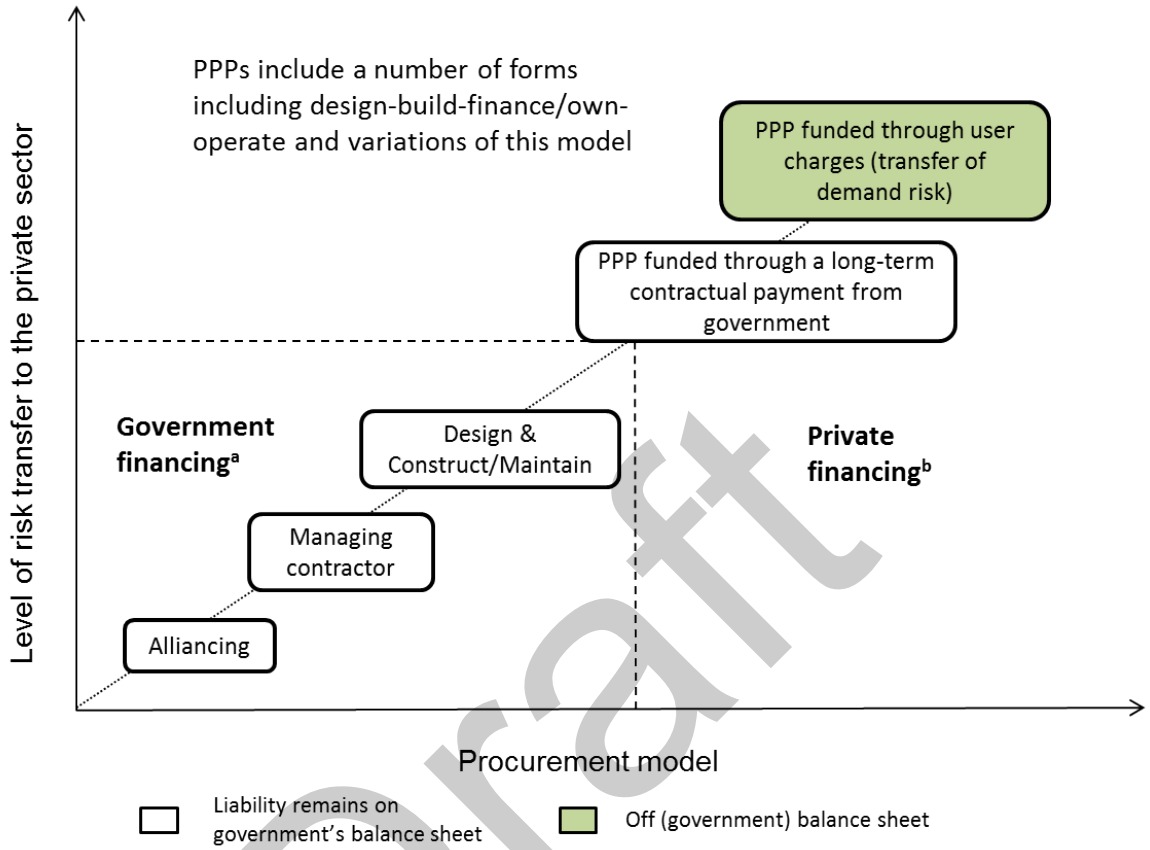
- design — the complexity of the design, scope for innovation, potential obsolescence, desire for flexibility
- capacity and capability — availability of suitable contractors and in-house resources and skills of the principal
- whole-of-life costs — merits of bundling, how to assess whole of life costs
- 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). The delivery model chosen should be appropriate to the types of risks the project is likely to face in practice (IA 2008a).

Under alliance contracting, risks are shared between government and the private party. As noted in chapter 11, 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. 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 allocated (for example, because risk cannot be quantified or there is disagreement over the price). These examples should be rare in an effectively-planned infrastructure environment.

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).

Traditional contracting models, such as design and construct or construct only models, enable construction risk to be transferred to the private party but do not enable risk transfer during the operational phase. On the other hand, PPP models are considered by some to be an effective means of allocating 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.

Further, not all risks are transferred under PPPs. PPPs funded using availability payments (for example, as used for the Peninsula Link and the East West Link projects in Victoria) involve the public sector assuming demand risk. As discussed further in chapter 6, if this approach is used, the value for money of using private financing, at potentially higher cost, must be found in the quality and efficient

delivery of infrastructure services. As experience grows with such payments, they may provide clearer indications of whether the approach provides the highest net benefit to the community.

3.4 Principles for efficient risk allocation

Like all infrastructure projects, public infrastructure involves a number of risks. Risk can be defined as the effect of uncertainty on objectives (Australian Government 2010), whether positive or negative. A typology of the risks that are typically associated with infrastructure projects is provided in box 3.4.

Some of these risks are project specific, such as site risk, while others are economywide, 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. Although risk is often used to describe negative consequences, it is useful to think about risks as also encompassing opportunities because uncertainty can result in outcomes that are more favourable than anticipated.

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 minimised through effective allocation and measurement.

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 upside benefits as well as downside costs from 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.
- Risks can be transferred to, and retained by, the private party.
- Risks can be 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.

Box 3.4 Risks associated with public infrastructure projects

Risks that typically relate to infrastructure projects are:

- **site risk** — the risk that the project land will be unavailable or unable to be used at the required time, or in the manner or at the cost anticipated, or the site will generate unanticipated liabilities (for example, due to planning delays).
- **design, construction and commissioning risk** — the risk that the design, construction or commissioning of the facility is carried out in a way that results in adverse consequences for cost and/or service delivery.
- **sponsor risk and financial risk** — sponsor risk is the risk (taken by governments that use a project financing model of procurement) that the special purpose vehicle (SPV) or its subcontractors will not fulfil their contractual obligations. Under a project financed PPP, the sponsor typically establishes the private consortium in the form of an SPV, which contracts with government. Financial risk is the risk that private finance will not be available, the project will not prove financially robust, or changes in financial parameters will alter the bid price before financial close.
- **operating risk** — the risk that the process for delivering the contracted services, or an element of that process (including the inputs used within or as part of that process) will be affected in a way that prevents the private party from delivering the contracted services according to agreed specifications and/or within projected costs.
- **market risk** — the risk that demand or price for a service will vary from that initially projected so that the total revenue derived from the project over the project term will vary from initial expectations.
- **network and interface risk** — network risk is the risk that the network(s) needed for the private party to deliver the contracted services will be removed, not adequately maintained or otherwise changed in a way that prevents or frustrates the delivery of the contracted services, affects the quality of the specified outputs or in some other way affects the viability of the project. Interface risk is the risk that the contracted services will not be compatible with the delivery of core services.
- **industrial relations risk** — this is the risk of industrial action occurring in a way that adversely affects commissioning, operation or viability of the project.
- **legislative, government policy and sovereign risk** — the risk that government will exercise its powers and immunities, including but not limited to the power to legislate and determine policy, in a way which negatively impacts or disadvantages the project.
- **force majeure risk** — the risk that an event (of a natural or political kind) entirely outside the control of either party will occur and will result in a delay or default by the private party in the performance of its contractual obligations.
- **asset ownership risk** — the risk that events such as technological change, construction of competing facilities or premature obsolescence will occur that may vary the economic value of the asset from the value upon which the financial structure of the project is based.

Source: Adapted from Department of Treasury and Finance (Vic) (2013b).

Some public infrastructure projects may be exposed to assumptions that third parties (external to the project) will facilitate the management of risk. This may especially 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 interface issues arising from construction activity occurring while the station remained fully operational (VAGO 2007). The role of third parties and the ability of governments rather than private contractors to manage third-party risk is worthy of further consideration in circumstances 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 PPP Guidelines outline principles for risk allocation and specify governments' preferred position on the allocation of a number of risks. However, as discussed later, in practice allocating risks 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 CLEM 7 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 may 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 (chapter 6).

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 2013b; Civil Contractors Federation, sub. 34, Industry Super Australia, sub. 60, Lend Lease, sub. 46, 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). They also have the best opportunity 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 broad principle 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 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 the risk at lowest cost. It may be argued that governments are able to absorb risks at lower cost than private parties, due to their ability to spread risk over millions of taxpayers. However, as argued earlier, private firms are also able to spread risk among a large number of shareholders and thus may be able

to absorb risk at a similar cost to government. 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

A party's appetite to accept risks may influence the extent to which risks can be allocated and the pricing of risks. Governments and investors vary in their appetite to take on risks (as noted later with regard to greenfield projects). 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 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.

Transaction costs are also an important consideration in the allocation of risks. The risks outlined in box 3.4 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 inputs used in construction, such as capital and labour. Similarly, operating cost risks can be divided into the different components of operation, such as operation and maintenance costs, and to the availability and quality of inputs used in operation. It may be efficient to allocate these more specific risks in different ways according to the above principles. Indeed many contracts do this (chapter 11). However, it may be costly to analyse very specific risks, to negotiate precise risk allocations, and to draft contracts that cover all possible types of risks. 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 will vary from project to project. The following sections discuss the principles in the context of some of the major risk categories in box 3.4.

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 will have private information, expertise, skills or some other strategic advantage and thus they will likely have the greatest ability to influence the corresponding risks. It is preferable, all other things equal, for the private party to be assigned these risks.

Some participants suggested that the allocation of construction risk is adding to the cost of construction. For example, the Civil Contractors Federation, sub. 34, suggested that in recent times governments have become far more averse to accepting project and/or construction risk and that this is adding considerably to the cost of infrastructure construction. Similarly, Business SA (sub. 31, p. 2) noted issues around how risk is managed between government and the private sector, suggesting that this was:

> … one of the reasons why construction costs are so high as contractors are having to factor in too high a risk premium to allow for the fact that they are subject to cost overruns from risks that are beyond their control.

However, as discussed further in chapter 11, it is unclear if construction risk has been inefficiently allocated. Further, it is unclear if the costs referred to by participants relate to construction risks or other types of risk, such as site risk, that may influence construction costs and which may be more appropriately handled by government, for example where construction is delayed due to unanticipated issues relating to land acquisition.

Allocation of demand risk

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 2013b). An example of this appears to be the East West link procurement strategy in Victoria. The Victorian Government has stated that this project will involve the private sector designing, constructing, financing, operating and maintaining the road for the PPP contract term (in exchange for regular availability payments over the life of the concession), with the Victorian Government retaining toll revenue and demand risk, at least initially (Victorian Government, sub. 81). Chapter 6 discusses the use of availability payments as a potential mechanism of encouraging 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 consider bearing demand risk through payments to the operator, for example funded by non-user charges (that is, taxes). However, as noted above, consideration should also be given, as part of a transparent process, to the private sector's willingness to price and accept risks for such projects.

There may also be situations where a government wishes to retain flexibility to use an infrastructure service in a particular way. 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 management of a portfolio of water supply options (box 3.5). In this case, the private operator has limited influence over demand for the service. As above, this may suggest that governments bear demand risk for the service and could do so through, for example, capacity and use of service payments to the plant operator.

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 provided by the infrastructure and where there is likely to be consistent demand, as in the 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 plan, SDP's role is to help 'drought proof' the greater Sydney area by providing a source of non-rainfall dependant drinking water that can be drawn on when available dam storage levels fall below a specified threshold. The 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 greenfield projects

Greenfield 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. Greenfield projects can involve high construction-cost risk and if the project fails there is no or limited alternative use for the asset. Demand risk is also high as there is little data available to assess patronage risk and the like. By contrast, brownfield 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 or expansion. In practice, however, some infrastructure may have both greenfield and brownfield elements, for example when new infrastructure is being built within an existing network. Further, the extent to which construction-cost risk may be higher or lower for greenfield projects compared with brownfield projects will depend on the specific project.

A number of participants pointed to greenfield risk, and 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; Lend Lease, sub. 46; Katz, sub. 45; Smart Infrastructure Facility, sub. 94; Victorian Government, sub. 81). In contrast, Transurban (sub. 61) considered that there remains appetite to take on patronage risk in the private sector among those with a longer investment horizon.

The principles for risk allocation outlined above can be applied to the consideration of greenfield infrastructure projects in the same way as they can for other public infrastructure projects that involve uncertainty about construction costs and demand. Where demand risk for greenfield projects is inappropriately transferred to the private sector — 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 — this may present an impediment to private sector participation. 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 greenfield risk, including availability payments, infrastructure bonds, government loans and guarantees (chapter 6). In considering these risk allocation proposals, it is important to note that approaches that transfer greenfield risk to the public sector do not eliminate these risks, they simply transfer the risk 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 legislative and government policy risk

Legislative and government policy risk can be specific to a particular project and/or relate to sector-specific or economywide policies, for example corporate income tax, interest rate, or environmental policy. Although governments can influence sector-specific and economywide policy, designing such policy to suit particular infrastructure projects risks distorting these policies and the economy more broadly. Moreover, all businesses are subject to sector-specific and economywide policy risk to some extent and must bear these risks in the same way as any other company choosing to invest. In some circumstances, the private party may also have an ability to influence the sensitivity of the project's value to an economywide risk, for example, they may be able to use financial market instruments to mitigate interest rate risk or exchange rate risks arising from infrastructure financing arrangements (Irwin 2007; Yescombe 2007).

On the other hand, there may be cases where government policy is directed specifically to the infrastructure project, such as through the use of price controls for toll roads or design standards for infrastructure projects. Price controls can affect the level of demand and revenues associated with the infrastructure service. As noted above, in these cases the government is responsible for controlling

price-related and design risks and should recognise this explicitly in contract design, such that neither party is misled.

Consequences of inefficient risk allocation

When risks are inappropriately transferred to the private sector then unnecessarily high premiums will 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 have significant implications for the cost of private financing (chapters 5 and 6) and can 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, as noted in chapter 6, past failures of investment projects have rarely discouraged investment over the long-term.

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.

If risks are inappropriately transferred to government they will ultimately be borne by the community when they arise, either through increased taxes (or increased 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 can reduce incentives for efficient management of the infrastructure service.

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
- implicit 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 the 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 the project briefs. The Council of Capital City Lord Mayors (sub. 73) noted that government agencies tend to try and transfer as much risk as possible on projects, 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 often risk is 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.

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, which results in higher costs and increased chance of project failure as risks are passed down the contract chain to subcontractors that cannot manage them. That said, 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 projects 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). Another possible reason is that the consequences of a risk occurring are not directly borne by public sector agencies but rather are borne by taxpayers generally.

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; Lend Lease, sub. 46; Smart Infrastructure Facility, sub. 94; University of New South Wales, sub. 44). This issue is discussed further in chapter 11.

Implicit government guarantees

Even where risk has been contractually allocated there can remain a residual risk that government may have to step in in the event 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).

In this context, 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. Governments (and the community) can also be exposed to costs from inadequately managed risks. 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 costs associated with public infrastructure projects that have not performed well. Two examples are provided below:

- 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 Government of New South Wales 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).

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 ownership rather than subsidising the struggling 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 PPP 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 2012).

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).

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, results that are highly sensitive to assumptions about the discount rate used and the methodologies applied for valuing risk transfer to the private sector.

Box 3.7 Public sector comparator

A public sector comparator is used as a benchmark when considering the potential value for money of delivering a project using a PPP arrangement. The purpose of the public sector comparator is to provide governments with a quantitative measure 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).

Few inquiry participants commented on the use of a public sector comparator, although 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)

INFORMATION REQUEST 3.1

The Commission seeks examples of where privately-delivered public infrastructure project tender processes at the Australian Government or state or territory level have failed to meet the public sector comparator.

Greater availability of such information would potentially offset concerns about transparency and that the public sector comparator is not meeting the purpose for which it was intended.

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 Victorian Government has recently announced changes to the role of the public sector comparator. 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 (Department of Treasury and Finance (Vic) 2013a).

Ex post value for money assessments

An important part of any consideration of value for money from the delivery 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, although some studies have been undertaken to assess the performance of PPPs as a method of public infrastructure delivery (box 3.2), complete comparisons are difficult due to

limited evidence of the whole-of-life *ex post* performance of traditionally-procured projects. The importance of project evaluation of public infrastructure projects is discussed in chapter 7.

3.7 The importance of government institutions and governance

As the above sections have shown, realising the benefits of private sector involvement in the provision of public infrastructure rests to a large extent on aligning incentives between parties through efficient risk allocation. Where risks are appropriately allocated then value for money from public infrastructure investment is likely to be greatest.

Achieving these benefits in practice rests on the presence of effective government institutions and governance arrangements, with appropriately skilled and experienced contracting personnel. In particular, authorities need to be able to understand risks and choose appropriate delivery models and contractual arrangements that effectively allocate risks between parties. These arrangements need to be supported by appropriate monitoring and accountability processes to ensure that contractual arrangements are adhered too.

Effective procurement management skills within government are important not only for the selection of the most appropriate model of delivery but also for the management and monitoring of risks and for the implementation and management of tendering and contracting arrangements once a delivery model has been selected. Approaches to improve governance and accountability arrangements in these areas are discussed in chapters 7 and 11.

4 Funding mechanisms

Key points

- In essence, the funds to pay for public infrastructure ultimately have to come from users and other beneficiaries, or from governments.
- Direct user charges 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 charging is being developed to more clearly signal costs to users and 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 charging using vehicle telematics.
  - Public transport would generally be undersupplied if it had to be primarily funded by user charges, given the wider benefits it generates and equity goals it meets.
- 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 the 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 charges, the 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 charging 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).[3]

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. The chapter begins with an examination of user charges, followed by consideration of value-capture approaches, developer contributions and government funding.

4.1 User charges

In principle, user charges 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 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).

[3] 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 private 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.

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. The main pricing options are outlined in box 4.2. Some of these approaches can be combined. For example, the access or variable components of a two-part charge might be varied according to willingness to pay.

Box 4.2 Pricing options for infrastructure with economies of scale

Short-run marginal cost (SRMC) pricing plus subsidisation of fixed costs

Public provision of services subsidised from taxation allows prices to equal SRMC, that is, incremental operating costs. However, there will be offsetting efficiency losses from raising taxes to fund public investment. In addition, there is a risk of inefficient investment and production due to a lack of market signals and commercial disciplines.

SRMC pricing, including congestion charging, over time

It is conceivable that, over the life of an asset, if demand increases over time and for long enough periods, total costs could (eventually) be recovered by SRMC pricing, because marginal opportunity costs will incorporate the marginal cost of supplying the service, plus congestion costs incurred by users. With large lumpy investments, SRMC pricing could mean losses for many years, with no certainty of ever covering costs. When the level of infrastructure is optimal, SRMC will equal long-run marginal cost.

Fully distributed (financial) cost approaches

Such approaches essentially allocate all financial, including common, costs according to accounting rules or formulae.

Average cost pricing

Average cost pricing for all units sold will recoup total costs of provision but may lead to a significant efficiency loss (through forgone consumption) where marginal costs are significantly below average costs and demand is price sensitive.

Long-run marginal cost (LRMC) pricing

If prices are set equal to LRMC, users pay for the attributable incremental operating and capital costs of their consumption of a service. However, common costs, which are not attributable to specific users, may not be recovered under this approach.

(Continued next page)

Box 4.2 (continued)

Ramsey pricing for common costs

The increment above marginal cost is set in inverse proportion to the price responsiveness of groups of consumers, so that unattributable costs are recouped in a way that least distorts consumption and output.

Two or multi-part pricing

Multi-part pricing structures allow common costs to be recouped via access fees, incremental capacity costs via access charges and marginal costs via variable, use-related charges. While the variable charge encourages appropriate consumption by those who pay the entry fee (subject to income effects of the access charge), those with a low willingness to pay may be discouraged from consuming at all.

Source: PC (2006).

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 has 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, 2013b). 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 (2013) estimated that, in 2011-12, total road expenditure by all levels of government and the private sector amounted to $19.5 billion. In comparison, the revenue collected from fuel excise, registration charges, driver's licence fees, stamp duty and tolls amounted to $18.0 billion. However, this excludes some significant revenues, including fringe benefits tax and goods and services tax on vehicles. Estimates made by the BITRE (2011) for earlier years suggest that such items 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 always 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 charges and taxes 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, and further reform is in prospect.

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

[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).

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 Standing Council on Transport and Infrastructure (SCOTI), based on advice from the National Transport Commission (NTC) (box 4.3).

Box 4.3 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 Standing Council on Transport and Infrastructure (SCOTI), 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 SCOTI 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). The decision to end indexation of the diesel excise in 2001 has effectively put an upper limit on the RUC. HVCI (sub. 77) estimated that the upper limit (38.143 cents/litre) will be reached within the next five to seven years, and so the current form of the RUC is not sustainable.

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 2006). 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 reform — such as the establishment of independent road funds — was 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 is currently being undertaken by the Heavy Vehicle Charging and Investment (HVCI) reform project (box 4.4).

Box 4.4 The HVCI reform project

The Heavy Vehicle Charging and Investment (HVCI) reform project was established by COAG to design a more efficient approach to charging and road provision for heavy vehicles. It is overseen by a board of senior officials from the three tiers of government and the freight industry.

A fundamental principle guiding the project is that user charges should be based on forward-projected expenditure, applied on the basis of actual road usage and cost, with the resulting revenue used to fund road expenditure for heavy vehicles.

Details of the proposed reforms are still being developed and are subject to agreement by governments. To date, various charging options have been considered, including a national fuel-based charge and a state-specific mass-distance-location charge.

Sources: Department of Infrastructure and Regional Development (sub. 64); HVCI (sub. 77).

Specific details of the proposed reforms are still being developed, but HVCI (sub. 77, p. 7) noted that it is seeking 'to introduce a market-based framework for the provision and use of road services, similar to the approach used for utilities and other network natural monopolies'.

The approach traditionally used for utilities involves a regulator determining the total revenue (revenue requirement) that a business is entitled to receive for services supplied. This is set so that the business can fully recover what is deemed to be its efficient costs, being the sum of an appropriate risk-weighted return on an efficient capital base, depreciation of that efficient capital base, efficient operating costs, plus any relevant taxes. The revenue requirement must then be translated into a set of prices for customers. This approach to regulating utilities was devised for businesses that are run on a commercial basis, either as corporatised government enterprises or private firms, which is not currently the case for road providers.

The reform proposal being developed by HVCI differs in that it has many of the characteristics of a road fund model. This model involves an independent road fund — possibly one in each jurisdiction — that coordinates expenditure plans across road providers (including local governments), receives the revenue from road-related taxes and charges, and allocates the funds to road providers according to clear assessment criteria at arms-length from government. The road fund model also usually gives the fund responsibility for deciding on the level of road-related taxes and charges, or at least recommending them to government. In contrast, HVCI envisages that a road fund — which it calls an infrastructure coordinator — would propose heavy vehicle charges to a regulator for approval. In approving charges, the regulator would need to be confident about expenditure proposals, service levels and demand forecasts. Another notable feature of HVCI's proposal is that it involves a shift from road-related taxes to a fee-for-service or user charging approach.

The pros and cons of different institutional models for roads, including HVCI's proposed approach, are considered further in chapter 7.

The Australian Logistics Council (ALC) supported HVCI's efforts, provided there is 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 Australian Trucking Association promoted a reform model that would divide 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 over seen by the NHVR [National Heavy Vehicle Regulator]. (sub. 27, p. 5)

It envisaged that funding allocations would 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 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 … (Australian Trucking Association, sub. 27, p. 5)

The Australian Trucking Association stressed that full cost recovery is inappropriate for roads in rural and regional areas that carry little traffic because such roads are largely provided to meet community service obligations (CSOs).

> 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)

It also backed reforms to road agencies. In particular, regular audits of road agency expenditure to verify the costs to be recovered from heavy vehicles, and benchmarking which could be the basis for a form of incentive regulation.

> … 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. (Australian Trucking Association, sub. 27, p. 4)

The above comments illustrate that there are numerous issues associated with reforming heavy vehicle charging. Such matters are being methodically considered as part of the HVCI project. Moreover, this work is being informed by regular consultations with interested parties and the expertise of the HVCI board, which comprises representatives from all tiers of government as well as the freight industry (including the Australian Trucking Association). The Commission supports the HVCI project and urges governments to draw on its advice as soon as possible to implement a reformed system of heavy vehicle charging.

The HVCI project is the appropriate body to consider the technical details of what reformed heavy vehicle charges should look like, and so the Commission has not explored the issue in depth for this inquiry. The Commission did closely examine the issue in its 2006 review of road freight infrastructure pricing, and sees no reason to change the conclusions it reached, which are generally consistent with the work of the HVCI project.

For this inquiry, the Commission considered that it could best add value by reconsidering the necessary institutional reforms to address the current disconnect between heavy vehicle road use and expenditure. As noted above, this is done in chapter 7.

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 vary between vehicle types — as they already do for different classes of heavy vehicles — to reflect differences in the cost of provision. 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.

Direct 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 4.5). This provides an opportunity to explore wider use of direct user charging.

Box 4.5 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.

To date, 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 traffic volumes justify the expense of monitoring use. This includes the electronic tolling systems currently used in Australia, which require costly roadside infrastructure — such as overhead gantries to read in-vehicle tags — and so would be impractical to implement across a network (even though the cost appears to have declined in recent years).

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.

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 to verify compliance with access restrictions limiting road damage and safety risks. Depending on the restrictions, the device monitors the date, time, speed and route used. If an access restriction is breached, the relevant road authority is informed.

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. More generally, the COAG Standing Council on Transport and Infrastructure has published a broad policy framework for intelligent transport systems, and the National Transport Commission is currently developing a compliance framework for heavy vehicle telematics. The HVCI project intends to trial the use of telematics for its proposed system of reformed heavy vehicle charges.

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Box 4.5 (continued)

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, 2013); 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 4.6).

Box 4.6 **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).

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 to design a system of charges that recovered 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. 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. In particular, the fixed registration charge (which could be thought of as an access fee to use the road network) and fuel excise (which collects more as use of the network increases).

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. It cannot be assumed that this will be the case, given that there is a cost associated with telematics, and motorists already face a de facto form of distance-based charging through fuel excise.

Moreover, it would be unrealistic 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.

Nevertheless, a number of inquiry participants supported consideration of wider road user charging. 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 Australian Logistics Council said that:

> … 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)

Some participants noted that the revenue raised from fuel excise has been declining in real terms, and this could provide an impetus for reform. The Australian Automobile Association (sub. 65) attributed the revenue decline to the 2001 decision to stop indexation of fuel excise, as well as a shift to more fuel efficient vehicles. Other developed countries face similar issues. 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 attachment; Transport Reform Network, sub. 54). 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.

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).

A shift to direct user charges purely to increase revenue could meet significant community resistance, as noted by the Australian Automobile Association.

> … 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, it may be necessary for any reform to be revenue neutral when adopted and for a specified period thereafter. If — and here 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.

In conclusion, more widespread 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. However, this requires many difficult issues to be addressed, and effective planning — a constant theme for all infrastructure — will be required. Moreover, as noted above, it cannot be assumed that the benefits from wider direct charging will outweigh the additional cost of monitoring how individual vehicles use a road network.

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 across their road networks, similar to what has occurred in Oregon. Realistically, it would difficult to amend Commonwealth legislation to allow a rebate on fuel excise similar to what occurred in the Oregon trials, so Australian experiments would probably have to use 'shadow prices' that motorists do not actually pay.

In any case, there would need to be 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 SCOTI, the NTC (which is currently developing a compliance framework for heavy vehicle telematics) and Austroads (the national association for Australia's road authorities). It would also be essential for motorists to be consulted in order to build community acceptance, such as through bodies like the Australian Automobile Association (the national association for motoring clubs) and its state and territory affiliates.

DRAFT 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 coordinate and share experiences; and ensure that motorists are consulted, potentially via roads and motorists associations. The pilot studies should be designed to inform future consideration of a (revenue neutral) shift to direct user charging for cars and other light vehicles, with the revenue hypothecated to roads.

Additional charges for congestion and other externalities

Discussion of road user charges often leads to a debate about whether there should be congestion charges. This is understandable, given that there has been an upward trend in the average delay experienced during peak periods in all of Australia's mainland state capitals since at least the late 1990s (figure 4.1). There is also evidence that the duration of peak periods has been getting longer (Vicroads 2013). In essence, road space is increasingly being rationed by queuing, with the length and duration of queues growing over time.

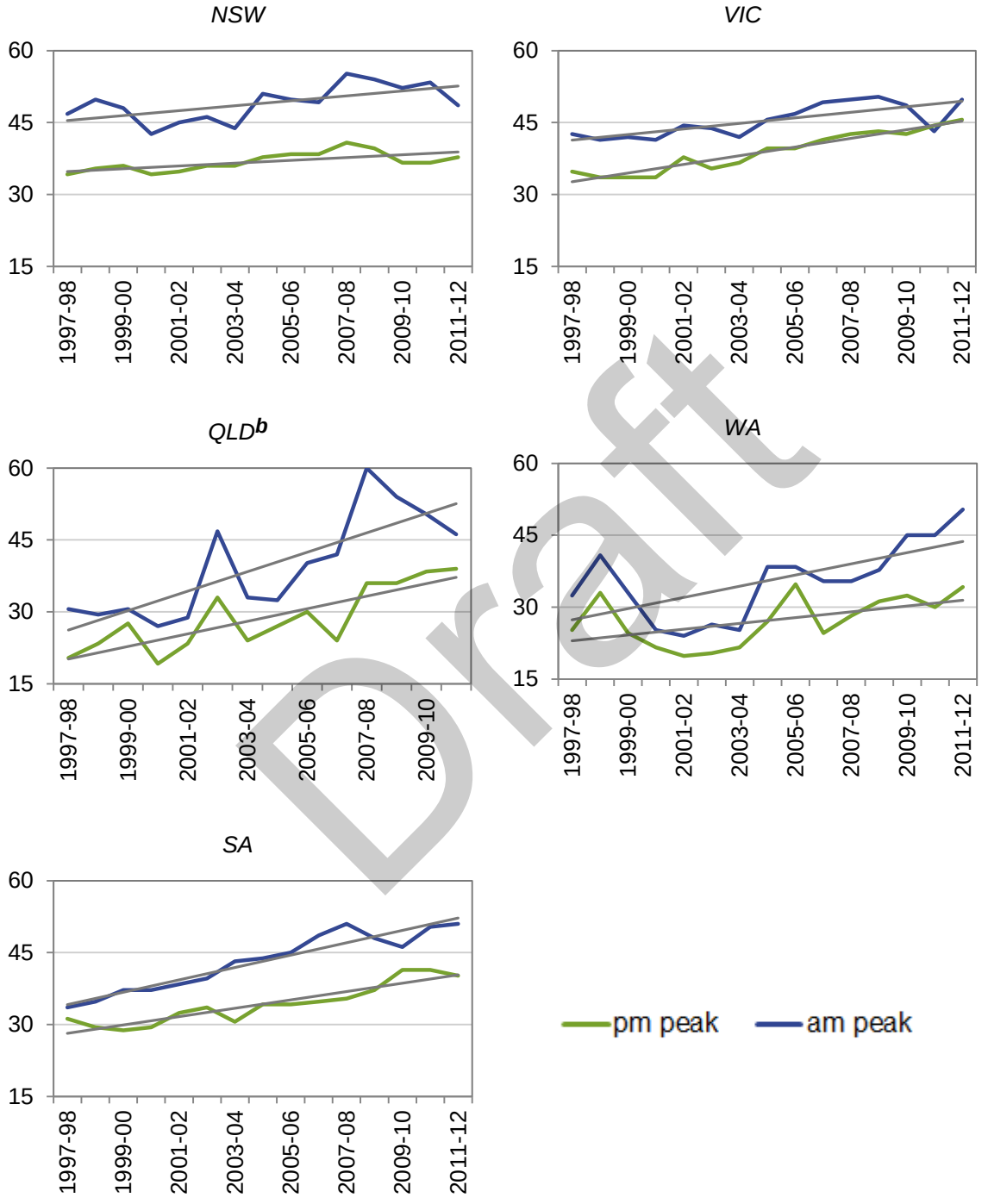
A congestion charge is meant to reduce traffic delays to an efficient level, and so should not be confused with the charge needed to recover the cost of building and operating road infrastructure.[5] Moreover, it is questionable whether the type of congestion charge that can be implemented in practice is the most efficient means of addressing traffic delays.

An optimal congestion charge would vary in response to actual traffic conditions, so that delays were always reduced to an efficient level. Leaving aside the question of whether it is possible to accurately determine the efficient charge for every level of traffic, it would be costly to administer such a system and motorists would find it difficult to process and react to constantly changing charges. Thus, where congestion charges have been implemented, they have tended be a flat fee, which raises doubts about whether they are in fact making traffic levels efficient.

5 In theory, an optimal congestion charge (set at the marginal cost of the externality) could recover the cost of providing and maintaining a road, assuming road capacity can be varied continuously in small increments and there are constant returns to scale in road construction and maintenance (Mohring and Harwitz 1962). In reality, road investments are lumpy and economies of scale can occur. For most roads, there is rarely any congestion and so a congestion charge would not recover costs.

Figure 4.1 **Average delay on urban arterial roads by jurisdiction and peak period, 1997-98 to 2011-12[a]**

Seconds per kilometre



[a] Data are collected for a sample of arterial roads in each state's metropolitan area. Delay is measured as the difference between actual travel time and the time it would take if travel occurred at the speed limit with no slowing down at intersections or for other traffic. [b] Queensland data only available up to 2010-11.

Source: Austroads National Performance Indicators.

Another systemic problem can also arise — a congestion charge on one road can lead to inefficient levels of congestion on alternative routes if, as is often the case, there is no charge on the alternatives.

Few governments around the world have adopted congestion charges, and where they have it has been far from the theoretical ideal (box 4.7).

Box 4.7 **The long history of proposals for congestion charging**

The case for imposing user charges to manage road congestion can be traced back at least as far as the early 20th century to a proposal made by the economist Arthur Pigou (1920). The logic is that motorists would act in the interest of the community as a whole if they faced a charge that reflected the cost they imposed on other road users by travelling on congested roads.

By the 1950s, rising congestion due to the rapid growth of car ownership prompted economists to give more in-depth consideration to how to set congestion charges and use road pricing more generally. This resulted in a number of seminal publications on the topic (including Mohring and Harwitz 1962; Strotz 1965; Vickrey 1963, 1969; Walters 1961). It also led to the development of specific policy proposals. One of the earliest examples was a congestion pricing scheme outlined by the economist William Vickrey (1959) for car travel in Washington DC. Since that time, transport economists have repeatedly urged governments to implement such congestion pricing.

However, several decades of advocacy for congestion pricing has failed to have much impact on transport policy. There are only a handful of congestion charging schemes across the world, and these tend to be far from the ideal envisaged in the literature.

Australia's experience is similar to that of other developed countries. Congestion pricing has been floated as an option in many reports to governments, including nationally under the auspices of COAG (CRWG 2006); in New South Wales (ACIL Tasman and Smart Infrastructure Facility 2012; NSW Government 2003); and Victoria (VAGO 2013; VCEC 2006). However, apart from the introduction of a higher toll in peak periods on the Sydney Harbour Bridge and Tunnel in 2009, congestion charging is an idea that Australian governments have repeatedly declined to implement.

By the late 20th century, a body of literature was developing on why the decades-long advocacy of congestion charging had been so unsuccessful. This points to a number of potential barriers, including concerns that road user charges may be inequitable, a perception among motorists that they would be overcharged because they already contribute through fuel taxes and other fees, the cost and technical challenges of directly charging for road use, and the potential for congestion to increase on unpriced alternative routes. Recognising that such barriers may preclude 'first-best' congestion pricing, or render it inefficient, transport economists have explored 'second-best' congestion charging schemes that are more practical and politically acceptable than the theoretical ideal. The literature also points to alternatives to direct road pricing — such as advanced traffic management — as potentially being more effective and efficient in some cases.

The above recommendation to use vehicle telematics to experiment with direct user charging across road networks could ultimately provide a means to price congestion efficiently. However, this will likely take some time to plan and develop community acceptance.

In the interim, there is a case for governments to continue to explore alternative measures to address congestion, such as:

- advanced traffic-management technologies — including ramp metering, dynamic speed limits, lane controls and traffic lights — which can significantly increase traffic throughput on a given road. Such technologies are progressively being implemented in Australian cities, partly funded by a national managed motorways program
- parking levies in city centres, such as those currently applying in Sydney, Melbourne and Perth
- an additional subsidy for public transport above what is justified to meet equity goals and to fund wider benefits that accrue to more than just passengers, such as improved urban amenity.

Developments in vehicle technology — such as adaptive cruise control and navigation aids that monitor and inform drivers of traffic conditions — could also assist in alleviating congestion on existing road networks.

Congestion is just one road-related example of what is known as an externality. Externalities occur when the actions of one party impose involuntary costs (or benefits) on others. Other road-related externalities can arise from vehicle emissions, noise and accidents. These are already addressed to some extent by measures such as vehicle standards and insurance, which are probably more effective and efficient than attempting to achieve the optimal level of externalities by imposing charges on vehicles (PC 2006).

Public transport

Public transport is the other significant area of land transport where direct user charges only recover a small proportion of costs. For example, in 2010-11, public transport systems in Sydney, Brisbane and Perth recovered less than 24 per cent of 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).

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 appropriate.

The NSW Government applies a version of the regulated utility model to this question. An economic regulator — the Independent Pricing and Regulatory Tribunal (IPART) — estimates revenue requirements for public transport modes and recommends how much should be funded by governments because of positive externalities and to meet equity goals. IPART has described its approach as follows.

> … we estimate the efficient costs of providing … services, and the value of the external benefits [positive externalities] these services generate for the community as a whole (such as reduced road congestion and greenhouse gas emissions) in each year of the determination period. We consider that taxpayers should fund a share of the efficient costs that is broadly equal to the value of the external benefits. We set maximum fares to reflect our estimate of the efficient costs minus the value of the external benefits and the costs of Government providing concession fares, taking into account the forecast number of passenger journeys per year. (IPART 2012, pp. 2–3)

IPART's most recent determinations recommended that the NSW Government fund 72 per cent of the efficient cost of urban rail and 60 per cent of the efficient cost of metropolitan and outer metropolitan buses (IPART 2012, 2013). This was based on the valuation of two externalities — avoided road congestion and air pollution — as well as the cost of the Government providing concessional fares.

While such an approach brings a degree of rigour and transparency to setting public transport fares and government funding, it has to be recognised that valuing externalities can be more art than science. Hence, there is a risk of false precision leading to misleading conclusions. The NSW Government has retained the power to set lower fares (higher government funding) than recommended by IPART, and has done so in recent years (Transport for NSW 2013).

Given the time constraint on this inquiry, it was not possible for the Commission to assess whether the current balance between public transport fares and government funding in each jurisdiction is broadly appropriate. But, as a general principle, governments should only fund public transport to the extent that it addresses externalities or is the most efficient means of achieving equity goals. The quantitative analysis undertaken by IPART in New South Wales suggests that there is a sound case for governments to fund a large proportion of public transport costs. However, as discussed below, governments can sometimes reduce the funding burden by exploiting opportunities for property development adjacent to public transport infrastructure, and by imposing a betterment levy on local residents.

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 has commenced work on developing a value capture framework.

Three value capture methods are considered below — betterment levies, tax increment financing, and 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 4.8). They have also been used overseas, such as in Denmark, Japan, Spain and the United Kingdom (VCEC 2006).

Box 4.8 **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 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); Committee for Melbourne (sub. 30); Department of Infrastructure and Regional Development (sub. 64); Eddington (2008); Ergas (sub. 87); Lee (2007); Mares (2012); Spearritt (2007).

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.[6] 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.

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 4.8).

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.

6 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.

Tax increment financing

The revenue collected from existing property taxes will tend to increase when new infrastructure increases 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). The Property Council of Australia (sub. 53) argued that a TIF approach would be inappropriate if Australia was to retain 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.

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 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 achieved by making such a requirement one of the conditions that the Australian Government attaches to its provision of infrastructure funding to the States and Territories.

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).

This has been a contentious issue 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 IPART, 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. 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 charges should be the default option for funding infrastructure because they can provide an incentive for efficient provision and use.

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, as noted previously.

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 all roads and public transport 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 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. Chapter 7 considers how to improve the Commonwealth's approach to allocating tax revenue to state and territory infrastructure spending. This includes an examination of what conditions should be attached to Commonwealth funding, such as requiring the States and Territories to utilise opportunities for users and other beneficiaries to fund a project.

5 Raising 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 of total infrastructure investment.
- Public private partnerships (PPPs) have increasingly been used by Australian governments to finance and deliver public infrastructure. It is estimated that PPPs have accounted for around 10 per cent of state capital spending on infrastructure in Victoria and New South Wales over the past ten years, and less in other jurisdictions. However, this fluctuates year to year, and geographically, given the 'lumpy' nature of such projects.
- The public sector still plays a significant role in financing public infrastructure projects through budget appropriations, government borrowing, or government trading enterprises. Given Australia's vertical fiscal imbalance, Commonwealth Government grants are an important source of public infrastructure finance.
- Private sector finance can be raised through corporate finance (where a company raises finance from its own balance sheet) or project finance (where a special purpose vehicle is set up to raise finance against the project itself). Project finance is more commonly used for PPPs.
- Private sector finance can generally be classified as either debt or equity finance, although there are some hybrid financing mechanisms. Equity finance has a higher risk–return profile than debt finance as it captures the residual returns after expenses (including debt) have been paid.
- Listed equity investors are a major source of private finance for public infrastructure, both in Australia and internationally. In Australia, a number of privately-owned infrastructure companies have invested in airports, ports, electricity, gas, and tollroads.
- 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. Further, superannuation funds invest mainly in brownfields, rather than greenfields assets.
- While corporate bond activity declined during the global financial crisis, there is evidence of a recovery.
- There is no shortage of private sector capital that could potentially be deployed to finance public infrastructure in Australia at the right price. While the global financial crisis may have changed the composition and timing of project finance, projects in Australia are still going ahead, and there is likely to be a continued supply in future years.

The terms of reference require the Commission to analyse how infrastructure is currently financed in Australia, including by the Commonwealth, State and Territory Governments, and by the private sector.

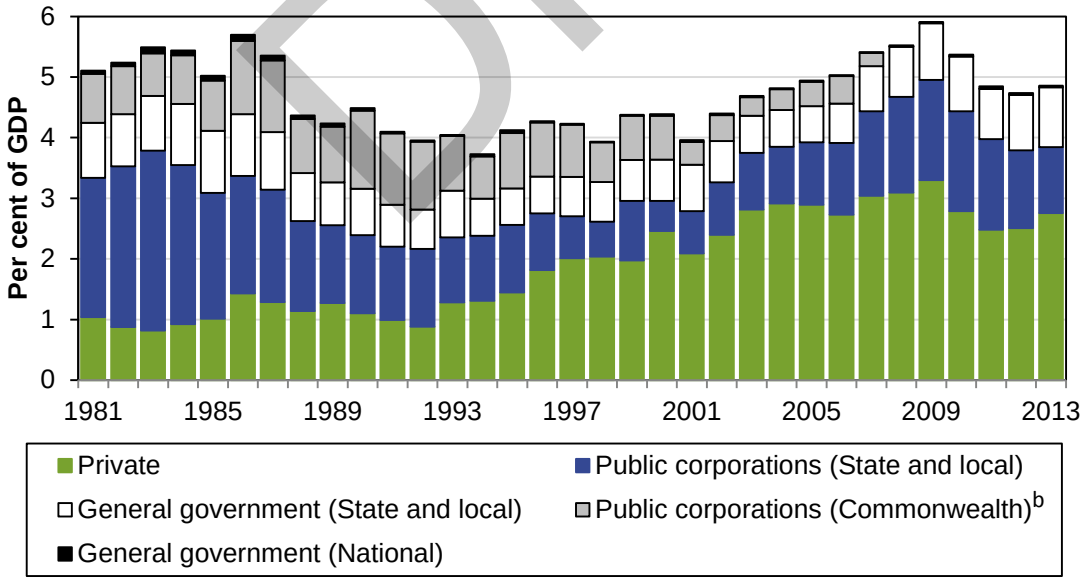
This chapter gives a brief overview of how finance is provided for public infrastructure projects in Australia. More specifically, it examines:

- how the role of the private sector has grown (section 5.1)
- sources of public sector finance (section 5.2)
- sources of private sector finance (section 5.3).

5.1 The role of the private sector has grown

As discussed in chapter 1, historically, governments have taken responsibility for most aspects of infrastructure provision because of equity considerations and market failures. Over the past two decades, the role of private sector investment has grown, and in recent years it has typically accounted for more than half of total infrastructure investment (figure 5.1).

Figure 5.1 **Sources of infrastructure investment**[a]
1981–2013



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 (2013).

Even where the characteristics of the infrastructure make it uncommercial for full private sector provision, governments have in some cases tended to share responsibility for delivery with the private sector. Public–private partnerships (PPPs) have been increasingly used, particularly in New South Wales, Victoria and Queensland, to involve the private sector in finance and long-term delivery of public infrastructure projects (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, p. 21).

Source: Adapted from Infrastructure Australia (2014).

Despite the recent growth of PPPs, they are still estimated to account for a relatively small share of capital spending on infrastructure — around 10 per cent of spending on infrastructure in Victoria and New South Wales between 2003–13, and less in other jurisdictions (Clayton Utz 2013). However, this fluctuates year to year and geographically, given the 'lumpy' nature of public infrastructure projects.

5.2 Sources of public sector finance

Despite the increasing role of private sector finance, the public sector still plays an important role in financing (and funding) public infrastructure projects. The public sector can raise finance through general government budget appropriations, government borrowing, or government trading enterprises (GTEs)[7].

Government budget appropriations are a financing vehicle, authorised annually by Parliament. The money available for government budget appropriations can be sourced from general taxation revenue, hypothecated taxes, fees and charges, asset sales, intergovernmental transfers, or government borrowing (Chan et al. 2009).

A government wishing to borrow to raise finance for an infrastructure project can do so through general purpose government borrowing, or issuing specific-purpose infrastructure bonds.

- General purpose government borrowing (debt finance) involves the government raising funds by issuing government bonds/debt securities on domestic or international markets through its central borrowing agencies. These bonds are not linked to specific activities. This is the main way in which government debt finance is currently raised in Australia.
- Project-specific infrastructure bonds can be secured on the asset, or against the revenue stream arising from the asset. However, in Australia, these were phased out with the financial reforms of the 1980s and 1990s (box 5.1). This is discussed in further detail in chapter 6.

Under Australia's federal system, state and local governments predominantly have the responsibility for providing public infrastructure (chapter 1), 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 (chapter 7).

[7] Also known as public trading enterprises, government business enterprises, public corporations, state-owned enterprises or government-owned corporations.

Box 5.1 Project-specific infrastructure bonds in Australia and overseas

Infrastructure bonds are project-specific securitised borrowings issued in the capital market to finance a particular project. Debts incurred through these bonds are usually repaid from income generated from the investments or government grants and 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 Australia, quasi-government entities used project-specific bonds to finance capital works from the mid-1800s. By the mid-1970s, there were a large number of 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, policymakers 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.

To achieve cost savings from scale, all borrowings by State and Territory Governments (including borrowings by government trading enterprises) have now been brought under their respective central borrowing authority. In issuing bonds, central borrowing authorities do not distinguish between the purposes of borrowing, nor do they communicate on whose behalf they are borrowing. Thus, project-specific government borrowing no longer exists in Australia.

Other factors contributing to the decline of project-specific infrastructure bonds include the inability of governments to avoid contingent liability. Despite infrastructure bonds being ostensibly secured against the asset, in practice they have often been guaranteed by the government with the attendant benefits of the government's credit rating. Where this occurs, the bond becomes practically equivalent to a government bond. Finally, the privatisation of a number of infrastructure services means that governments have become responsible for less public infrastructure provision over time.

Source: Chan et al. (2009).

GTEs can be created to operate an infrastructure asset or network of interrelated assets and take responsibility for service delivery. A GTE is a government-owned or controlled entity that produces goods or services on a commercial basis. GTEs can source finance from retained earnings (profits after tax equivalents), government equity injections, or, increasingly, borrowing in their own right from government, or from private capital markets.

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' (Chan et al. 2009). However, this description could be misleading, given that GTE borrowing is normally subject to an explicit government guarantee and taken into

account by credit rating agencies as a contingent liability. In cases where there is no explicit government guarantee (such as for Airservices Australia) the relevant agency's debt will still be rated on the assumption that they are providing an implicit guarantee to the GTE, but the debt will generally not be reflected in the government's overall credit rating.

5.3 Sources of private sector finance

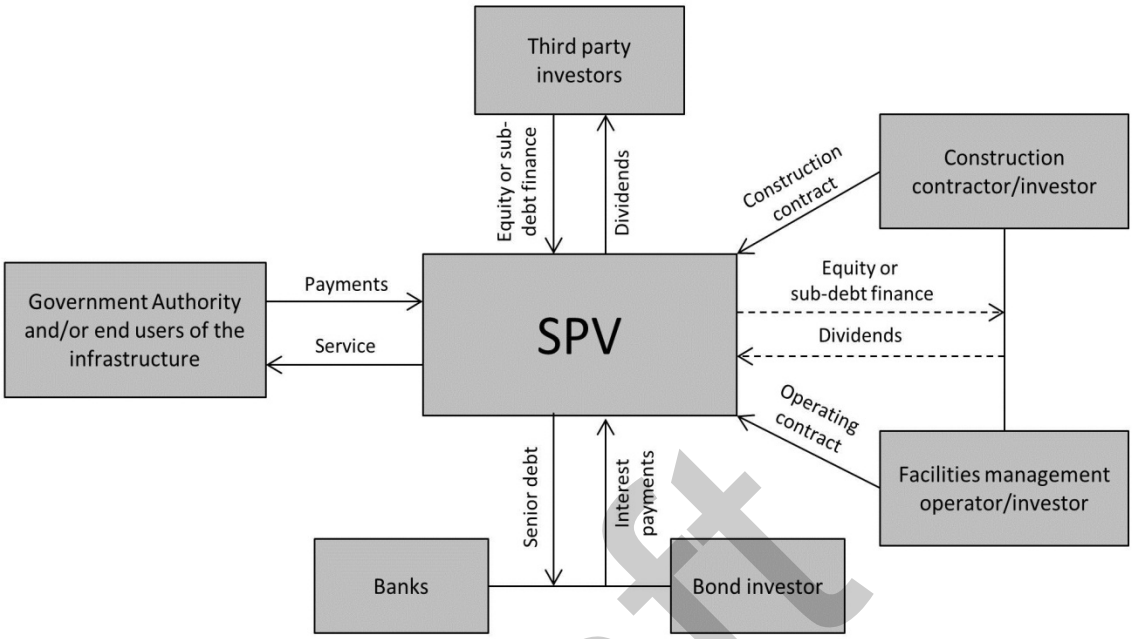
Who raises private sector finance?

PPPs often involve both government and private sector finance. Where private sector capital is required, it can be provided in two main forms — corporate finance and project finance.

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 from its own balance sheet (Yescombe 2007). This approach has been used in the airport, port and energy sectors in Australia to finance the incremental long-term development of infrastructure facilities, where investment decisions are largely in the hands of the private provider.

By contrast, project finance is raised by a special purpose vehicle (SPV) set up as a limited liability company (figure 5.2). This is used in circumstances where corporate finance is not possible, for example, where a project is too large for the corporation itself to take the risks on its own balance sheet, as is often the case for major public infrastructure projects. The higher risk profile of projects means the project is usually more highly geared, and the required return on capital will be commensurately higher. Project finance also has the advantage of being non-recourse, since the lender's security is confined to the project assets rather than the company's assets (Engel, Fischer and Galetovic 2010). The special purpose vehicle will quarantine and administer risks, and also raise the required debt and equity finance for the project. This approach is often used in the natural resources, energy and infrastructure sectors (Yescombe 2007), and greenfields tollroad projects.

Figure 5.2 **Typical project finance structure, PPPs**



Source: NAO (2012).

Forms of private sector finance

There are many different forms of private sector finance. Broadly speaking, they can be categorised by:

- financing instrument — equity or debt finance
- investment route — direct (involving the purchase of equity or debt in a specific infrastructure project) or indirect (via infrastructure funds or infrastructure-based companies)
- investment vehicle — publicly traded (listed on the public stock exchange) or privately traded (unlisted).

Table 5.2 shows how these categories relate to each other. Sometimes, however, investment occurs through mixed instruments or hybrid vehicles, which cannot be properly classified along these lines — for example, subordinated debt has characteristics that are similar to both debt and equity.

Table 5.2 **Direct and indirect financing instruments**

Type of finance	*Method of raising*	*Direct*	*Indirect*
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
Debt	Bonds	Corporate bonds of infrastructure companies, project bonds, PPP bonds, US municipal bonds	Infrastructure bond funds
	Loans	Direct loans to companies, projects, asset-backed financing	Infrastructure loan/debt funds

Source: Adapted from Inderst (2013).

Equity finance

Equity investors are exposed to uncertain returns, and they are also first in line to bear losses if a project encounters serious difficulties. Thus, greater proportions of equity in the capital structure of a PPP project reduce the relative risk borne by debt providers (Vecchi, Helloewell and Gatti 2013). However, in exchange for accepting a higher proportion of risk, equity investors will also expect to receive higher returns than debt providers. After payments of operational costs and debt repayments are made, equity will take the benefit of any upside in project performance — that is, the residual of the revenue received less expenses paid (HM Treasury (United Kingdom) 2012).

In general, there are two types of equity investors, primary and secondary investors:

- Primary investors are those who invest in a project at its inception (greenfields projects). This usually includes construction companies, although equity may also be raised from third-party investors and financial institutions, including investment banks and investment management firms.
- Secondary investors are those who buy the equity of already-developed projects (brownfields projects) that have a stable revenue stream and hence a lower risk profile (NAO UK 2012).

This section will examine the role of listed equity investors and superannuation funds in providing equity finance.

Listed equity investors

Corporate equity is a major source of private finance for infrastructure and, internationally at least, companies listed on public stock exchanges are the most sizeable owners of infrastructure assets (Inderst 2013). Listed companies can include companies that act as operators, contractors, developers of projects, or more diversified conglomerates acting in infrastructure sectors.

For example, in Australia, a number of privately-owned infrastructure companies listed on the Australian Stock Exchange have invested in a range of infrastructure assets, including airports, ports, electricity and gas utilities, and tollroads. Just eight of these companies have a combined market capitalisation of over $43.5 billion, and they also tend to reinvest a significant proportion of their operating cashflow into further capital expenditure (box 5.2) (Office of the Infrastructure Coordinator, sub. 78, attach C).

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 estimated global stockmarket capitalisation. Further, since the mid-2000s, the major index fund providers have also started to offer specialist infrastructure indices. Today, global infrastructure stockmarket indices contain up to 350 infrastructure companies, with a market capitalisation of up to US$2.5 trillion (Inderst 2013).

Box 5.2 **Examples of listed corporate infrastructure investors in Australia**

- *AGL Energy Limited:* An Australian integrated energy company operating retail and merchant energy businesses, power generation assets and intermediate generation plants. It has a market capitalisation of approximately $8.9 billion.
- *APA Group:* A gas transmission company with a market capitalisation of approximately $5 billion and reinvests 74 per cent of its operating cashflow into capital expenditure.
- *Spark Infrastructure:* Owner of regulated energy assets with a market capitalisation of approximately $2.2 billion and reinvests 108 per cent of its operating cashflow into capital expenditure.
- *DUET Group:* Owner of regulated energy assets with a market capitalisation of approximately $2.6 billion and reinvests 50 per cent of its operating cashflow into capital expenditure.
- *SP Ausnet:* Owner of regulated energy assets with a market capitalisation of approximately $4 billion and reinvests 148 per cent of its operating cashflow into capital expenditure.
- *Envestra:* Transmits and distributes gas with a market capitalisation of approximately $2 billion, and reinvests 103 per cent of its operating cashflow into capital expenditure.
- *Sydney Airport:* Owner and operator of Sydney Airport with a market capitalisation of approximately $8.8 billion and reinvests 24 per cent of its operating cashflow into capital expenditure.
- *Transurban:* Owner of a portfolio of tollroad assets in Australia and North America with a market capitalisation of over $10 billion and reinvests 81 per cent of its operating cashflow into capital expenditure.

Sources: Commission research; InvestSmart (2014); Office of the Infrastructure Coordinator, sub. 78, attach C.

Superannuation funds

Australian (and Canadian) superannuation funds have a higher asset allocation to infrastructure assets than pension funds in the rest of the world. On average, Australian superannuation funds are estimated to have invested around 5 per cent of their total assets in infrastructure (Inderst and Della Croce 2013), compared to less than 1 per cent in the rest of the world. Estimates of the value of Australian superannuation assets allocated to infrastructure vary, but are likely to have been at least $63 billion in December 2013 (box 5.3). However, in addition to investing in listed and unlisted assets, superannuation funds are also exposed to infrastructure through their investments in listed companies that invest in infrastructure assets and in other investments such as index funds.

However, the total proportion of global finance provided by pension funds remains small — between January 2012 and February 2013, pension funds provided just 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).

Box 5.3 Estimates of Australian superannuation fund investment in infrastructure

- Excluding self-managed superannuation funds, superannuation assets were approximately $1.25 trillion as at 31 December 2013 (ASFA 2014). If, as per previous estimates, 5 per cent of this was invested in infrastructure (EY 2014), this would have amounted to $62.75 billion at December 2013.
- There are no comprehensive data on the proportion of assets allocated to Australian infrastructure assets. Industry Super Australia (sub. 60) point to a large Australian industry fund holding $6.5 billion in infrastructure assets, with just over half of that invested in Australia.
- The Australian Prudential Regulation Authority does not report data on superannuation fund investments in infrastructure assets. 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 (EY 2014).

As an example of the allocations to infrastructure made by an Australian superannuation fund, Cbus (sub. 67) has noted that 0.7 per cent of its portfolio is co-invested in ports in New South Wales, and a further 9.6 per cent of the fund is invested through its investment managers, IFM Investors and Hastings Funds Management. That said, there is likely to be significant variation between the level of investment in infrastructure made by different types of superannuation funds, and how they invest. In particular, larger funds have scale advantages which allow them to have a greater proportion of their assets invested in more illiquid asset classes such as infrastructure (Industry Super Australia, sub. 60).

Further, the vast majority of investment occurs in brownfields assets (IFM, sub. 79; box 5.4). These asset classes are more attractive to institutional investors such as superannuation funds because they provide a long-term stable revenue stream (NAO UK 2012). Dividends for brownfields infrastructure companies are relatively stable (remaining around 5 per cent), revenues are reasonably certain and operating risks are low (Office of the Infrastructure Coordinator, sub. 78, attach C).

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. For example:

- 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 (who 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.
- 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.
- Adelaide Airport is 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, the leases were owned by the Australian Pacific Airports Corporation Limited, which was comprised of AMP (49.9 per cent), Deutsche (25 per cent), Hastings (10.0 per cent) and BAA plc (15.1 per cent). These airports are now owned by AMP (28.5 per cent), IFM Investors (23.6 per cent), Deutsche (19.9 per cent), the Future Fund (19.12 per cent), and Hastings Fund Management (8.7 per cent).

Sources: Australian Trade Commission (Austrade) (sub. 74); EY (2014); IPA (2012); Inderst and Della Croce (2013).

However, it should not be assumed that, because superannuation funds have a long investment horizon, they will retain an infrastructure asset over the course of its life — indeed, the Melbourne and Launceston Airports are examples of this (box 5.4). International experience has shown there is the potential for equity investors to make significant profits on secondary markets (HM Treasury (United Kingdom) 2012; NAO UK 2012).

Debt finance

Debt finance involves cash being advanced in exchange for a contractual promise to repay interest and principal[8] to the lender at a certain point in the future and in accordance with the terms of the contract. Thus, debt financiers generally have a certain stream of repayments (or in the case of floating rate date, a stream of payments determined by reference to a known index). Debt will be repaid before equity in the event of project difficulties and hence generally has a lower expected risk–return profile. Debt can also be secured against particular assets of a firm or project.

This section examines the role of bonds and bank loans in financing public infrastructure projects in Australia.

Depth of Australia's bond market

Historically, corporate bonds have been an important source of finance, constituting about 10 per cent of global project debt between 1994 and 2012 (Inderst 2013).

The Australian corporate bond market is small by international standards, and this has been argued to affect the availability of bond finance. For instance, the Australian bond market provided approximately $2.3 billion of long-term unwrapped project bonds between 2000–06, and $6.2 billion of long-term monoline wrapped project bonds between 2005–07 (Office of the Infrastructure Coordinator, sub. 78).

However, the Office of the Infrastructure Coordinator (sub. 78) found evidence of deepening in Australia's *corporate* bond market, and that market forces seem to be increasing demand for *project* bonds (box 5.5). Further, it found that, where Australian bond finance is not available, many infrastructure issuers (which are usually rated BBB+/Baa1) can go overseas instead — for example, to the private placement market in the United States.

Even though international bond markets might be available to Australian infrastructure firms, costs incurred when accessing these markets could exist. For example, currency risk could be a constraint on infrastructure firms obtaining international bond finance with a long tenor.

[8] Historically, governments were able to issue bonds called 'consols' which were equivalent to a perpetuity — that is, a regular payment received without any time limit, but for which the principal did not have to be repaid (Buckle and Thompson 1998).

Box 5.5 Increasing depth of the Australian corporate bond market

The development of the corporate bond market generally, and in particular at lower credit grades, was acknowledged as a key hurdle for greater use of project bonds, particularly for greenfields infrastructure. It was noted that a handful of investors represent a large share of the market, therefore their support is critical. Since then there have been some notable and encouraging developments in the domestic corporate bond market.

- Total annual issuance has recovered to levels approaching pre-global financial crisis levels of around $11 billion (2013 issuance was around $8 billion).
- Issuance at the BBB credit rating level has increased as a proportion of total issuance from around 25 per cent in 2012 to around 45 per cent in 2013.
- Issuance of longer tenors, of seven years and greater, has increased as a proportion of total issuance from 20 per cent in 2012 to 44 per cent in 2013.
- Recent issuance by BBB borrowers has increased to up to $525 million for a single tranche, a record level, and attracted orders from over 55 accounts.
- 12 new issuers have entered the market in the last year, which is around double the usual number of new issuers.
- A nascent unrated and sub-investment grade market has emerged.

In terms of project bonds, market forces that may lead to greater appetite for infrastructure debt from institutional investors include:

- a limited number of non-bank infrastructure debt investors are now tending to invest alongside banks in bank groups given the attractiveness of the returns and shorter duration assets available in that market
- increased appetite for lower rated, higher yielding, corporate credit generally
- debt and infrastructure fund managers, as well as investment banks, examining and considering entering the market.

Source: Office of the Infrastructure Coordinator, sub. 78, attach. M.

Thus, the Commission seeks feedback on the availability of bond finance for public infrastructure projects in Australia, particularly the depth of the corporate and project bond markets in Australia, and any barriers to accessing international bond markets.

INFORMATION REQUEST 5.1

The Commission seeks feedback on the availability of bond finance for public infrastructure projects in Australia.

- *To what extent are there impediments to the development of the Australian bond market to support investment in infrastructure?*

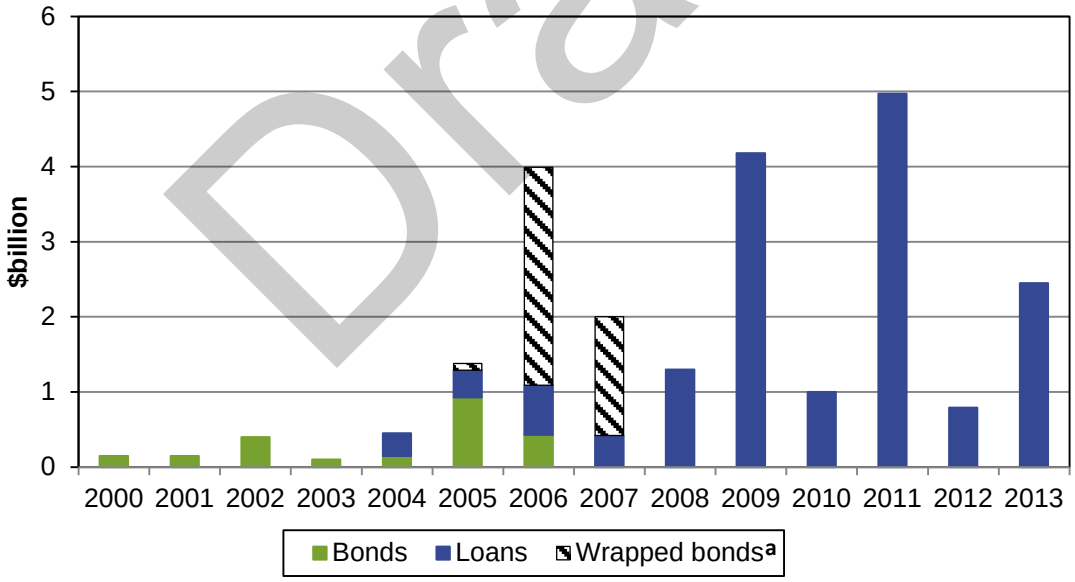
- *To what extent are there barriers to Australian infrastructure firms accessing international bond markets?*

Impact of the global financial crisis

During the global financial crisis (GFC), a range of factors decreased the availability of bond finance, including the repricing of risk and the demise of monoline insurers. Since the GFC, the global use of bonds has been lower (decreasing from 10 per cent to between 3 and 8 per cent) (Inderst 2013).

This has had an impact on the composition of finance provided to public infrastructure projects — a substitution towards bank loans has occurred. For example, the Office of the Infrastructure Coordinator noted this was the case for availability payment PPPs (figure 5.3) — although it is likely that the use of availability payment models themselves has also increased following the GFC.

Figure 5.3 **Sources of debt for availability payment PPPs**
2000–13



[a] Wrapped bonds are those bonds which are guaranteed by a monoline insurance company.

Source: Office of the Infrastructure Coordinator, sub 78, attach. M.

Currently, bank loans are the largest source of project finance, accounting for 63 per cent of all global project finance provided between January 2012 and February 2013 (Inderst 2013). However, there are concerns that, as a result of the GFC, bank loans are now subject to higher borrowing costs, shorter loan tenors and more extensive covenants.

This increased reliance on bank loans has, among other things, caused concerns about increased refinancing risk for public infrastructure projects (Office of the Infrastructure Coordinator, sub. 78, attach. M). The higher risk (and hence higher gearing) of greenfields projects changes over time as construction costs and demand for services reveal themselves. Refinancing becomes an issue if the value of the asset is less than its cost, and several recent PPP projects, such as AirportLink and Clem7 in Brisbane and the cross-city tunnel in Sydney, have experienced difficulties at this stage.

Participants have suggested that longer finance tenor allows a project to better match long-term risk of the project to the financing structure. This is discussed in chapter 6.

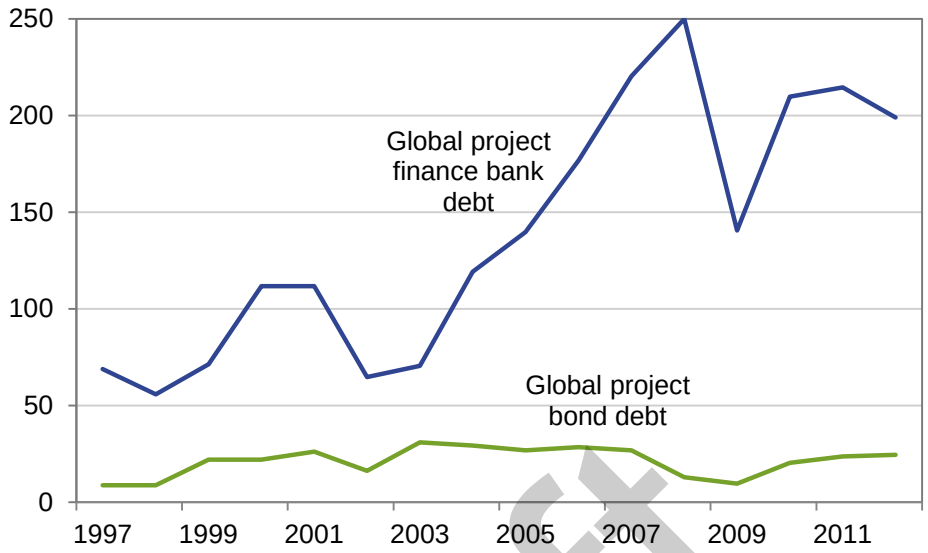
No shortage of private sector capital

As discussed earlier, there is evidence to suggest that the composition of project finance changed during the GFC and immediately afterwards due to a number of factors, including the repricing of risk.

However, there is evidence that financial markets are recovering from the GFC — for instance, the corporate bond market has shown strong signs of recovery (figure 5.4). Similarly, project bond volumes increased from US$15.6 billion in 2011 to US$ 24.9 billion in 2012. (While bank loans decreased from US$327 billion in 2011 to US$289 billion in 2012, some of this could have been due to substitution between loans and bonds) (Inderst 2013).

Further, despite the continued reliance on bank loans in Australia, the Office of the Infrastructure Coordinator noted that banks are considered to be pricing greenfields risk appropriately and equity investors are willing to take on and price refinancing risk arising from the provision of short-term bank loans (sub. 78, attach. M).

Figure 5.4 **Global project finance bank and bond debt**



Source: WEF (2014).

The Commission has previously found that, following a dip during the GFC, lending by banks to non-financial corporations has returned to pre-GFC levels, and Australian firms continue to access debt and equity finance in domestic and offshore markets, although finance may be more expensive than was the case prior to the GFC (PC 2012a).

Similarly, there is generally a sufficient appetite from both the equity and debt markets to finance commercially-sound public infrastructure at a reasonable rate of return reflecting the risk in the project (Westpac, sub. 51), provided there is a funding stream available to support the finance (Committee for Melbourne, sub. 30). The lack of private sector appetite to finance public infrastructure projects appears to be mainly driven by reluctance to take on greenfields patronage risk, and participants have suggested this can be overcome by governments providing a commensurate funding stream through availability payment models (AMP Capital, sub. 86). This is discussed in chapter 6.

Overall, there appears to be no shortage of private sector capital that could potentially be deployed to finance public infrastructure in Australia for commercially-sound projects. While the repricing of risk may have changed the composition of finance in recent years, there are still significant levels of private sector investment occurring in Australia and overseas.

DRAFT FINDING 5.1

There is no shortage of private sector capital that could potentially be deployed to finance public infrastructure in Australia. Private capital markets will finance most projects at the 'right price'.

However, participants to this inquiry have suggested that adjustments should be made to the project financing structure as a result of this repricing of risk. Mechanisms proposed by participants for the reallocation of risk, particularly greenfields patronage risk in public infrastructure projects are 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 fiscal outcomes. This judgment may be open to question, and is better made on the size of the benefit potentially foregone than solely on fiscal grounds.
- Private sector involvement in financing can generate some advantages for the economy, through improved risk management. However, the gains from improved risk management depend on how the risks are allocated between the parties.
- Various impediments raise the cost of private sector financing, some of them specific to infrastructure. In particular, there are cases where high procurement costs restrict the involvement of equity finance in the early stages of a project.
- Most of the mechanisms proposed by participants to facilitate private sector involvement involve privatisation or are aimed at shifting the non-commercial component of the investment to governments.
- The costs and risks of using different types of mechanisms should be properly identified and weighed against the potential benefits in a transparent and neutral decision-making framework.
- At this point, the Commission can see no case for advantaging finance for infrastructure investments via special tax treatment; nor for public sector guarantees of private sector debt. However, further analysis will be conducted.
- Similarly, at this point the concept of an infrastructure bank — while under consideration in the US, and active in Europe — appears to offer little benefit in addressing the identified issues in Australian infrastructure investment.
- Various other private financing mechanisms may offer benefits in particular circumstances, which are best judged by how they fare in allocating risks effectively. Risks will vary with infrastructure proposals, and accordingly no one instrument appears to be preferable in all circumstances.
- There is merit in further investigating ways to reduce procurement costs to encourage greater participation of equity financiers in greenfield infrastructure projects.

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 Commonwealth posed by

alternative funding and financing mechanisms; as well as their possible impact on the Budget and fiscal consolidation goals.

This chapter outlines an assessment framework and examines the various options proposed by participants.

6.1 Assessment framework

Trade-offs between private and public financing sources

Chapter 3 identified the main benefits and disadvantages that could be potentially associated with private sector involvement in infrastructure financing.

Essentially, the key potential gains arise from:

- Better incentives, discipline and expertise in managing various commercial risks during the project's construction and operation — while efficiency gains are hard to measure and they generally depend on contract design, several studies found evidence of improved cost certainty and timeliness of construction.
- Improved discipline on the investment decision — the private sector's stronger incentives for discipline on the initial assessment, design and contracting for operation of a project and the decision to apply user charges could be used by government to improve its own decision making.

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 — there is evidence that the long-term and complex nature of public private partnership (PPP) contracts means they are more costly to negotiate, monitor and enforce and that they place greater pressure on the government retaining an adequate stock of public sector skills.

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 also some 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 the government's own balance sheet is that this would increase the 'pool' of funds available for infrastructure investment (for example, Transurban, sub. 61).

However, the impact on the government budget needs to be assessed over the life of the project. If a 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, and has an impact similar, perhaps greater, 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 practice, depending on the funding model chosen, the allocation of risks between the government and the private financier, and the actual performance of the infrastructure asset, the government's budget position may deteriorate, improve or remain unchanged. 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 infrastructure borrowing from the Australian Government by virtue of involving a private partner, where that deduction would not be available if the project was fully funded and delivered by the state government.[9]

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.

9 However, in this case, any fiscal gain to a state government results from an equivalent transfer from the Australian Government.

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 can provide a revenue stream to recoup the initial investment, and to the extent that greater reliance on user charging is feasible, this can facilitate additional private sector involvement in financing. This could lessen the impact of infrastructure financing on the government balance sheet, for a given level of taxation.

However, user charging cannot be relied on to fully bridge any gaps left by government fiscal constraints, because it could only be used to recover the *private* benefits that accrue to users of infrastructure, and is not an effective mechanism for recovering the benefits to non-users. As discussed in chapter 1, many infrastructure projects have 'public good' characteristics. 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 relax the public fiscal constraint, or to accept a lower than optimal level of infrastructure provision.

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. 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).

However, while 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 will also provide

opportunities for risks to be pooled and spread efficiently (Brealey, Cooper and Habib 1997).

Notwithstanding the above, public sector borrowing could generate savings for the taxpayer where the private financing market is not competitive and financiers are exploiting their market power. In those cases, competition from the public source of financing could put pressure on private sector margins. However, the Commission has not received evidence that this is a problem in Australia (chapter 5).

Is public sector debt inherently undesirable?

A common public perception is that rising government debt levels are synonymous with financial imprudence and hence, inherently undesirable. This has been particularly the case since the global financial crisis. However, when governments are considering whether or not to borrow, it is important to consider for what purpose the funds will be used.

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 the net benefits of the project to the community are positive, 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, and some projects cannot be financed privately due to their public good characteristics.

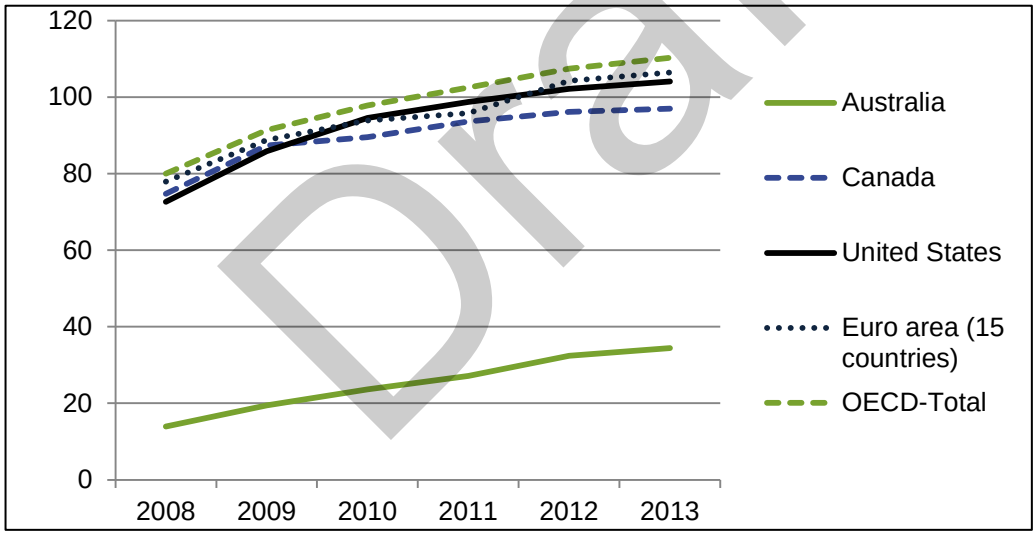
If the government decides to finance the project itself, it has two choices. It can appropriate the funds from consolidated revenue, which would ultimately come either from reduced expenditure or higher taxes, and will subsequently be partly or fully recouped through revenues generated by the project. Alternatively, it can borrow. However, government borrowing has to be paid off in the future. Again, governments can only pay off debt through reducing expenditure, raising taxes or using the funds generated by the project. Thus, government borrowing and taxation are equivalent in the long run, and the decision to finance a project through government debt or appropriation of consolidated tax revenue is essentially a question about whether or not the project should be paid for now or in the future.

There are a range of factors which 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 apparent that shifting the funding burden on future generations is necessarily 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 true would vary from project to project.

As discussed in chapter 5, Australian and State and Territory governments can borrow or use general revenue appropriations 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 Commonwealth of Australia, has a AAA rating, and no State or Territory Government has been rated below 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).

Figure 6.1 **Gross domestic debt as a percentage of GDP for selected economies**



Source: OECD (2013a).

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. Therefore, the implementation of the Commission's proposed package of reforms is essential to achieving value for money on behalf of the community.

DRAFT FINDING 6.1

Where project selection decisions are consistent with recommendations made in this report, there is additional capacity for the Australian and State and Territory Governments to finance public infrastructure from their own balance sheets through the issue of sovereign debt and/or through tax.

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 (DIRD), 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 financing and capital markets or other areas of policy that interact with the private sector's willingness or ability to finance public infrastructure. Where those impediments are preventing efficient private investment, the optimal role for government is to address those impediments at their source. Designing specific instruments that only address the impediments insofar as they relate to investment in infrastructure is likely to be a second-best approach, particularly where other processes are currently 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 greenfield 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 flow on implications for equity investors because it increases refinancing risks	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 brownfields assets 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 'cliff' at end of accumulation phase.	BCA (sub. 39); CBUS (sub. 67); ISA (sub. 60)
Taxation issues	Lack of tax incentives for entities that carry on 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	DIRD (sub. 64); BCA (sub. 39)
High transaction costs	PPP bid processes are costly, precluding participation by some potential participants	ISA (sub. 60); CBUS (sub. 67)
	Lack of specialist skills in smaller superannuation funds precluding participation in the bid process	Transurban (sub. 61); Lend Lease (sub. 46); BCA (sub. 39)

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. Consequently, many of the mechanisms and instruments proposed by participants, in essence presented different ways to transfer some of the risk of private sector involvement to the government.

A related theme in many submissions was that the global financial crisis (GFC) affected the operation of financial markets, particularly in the way risk was priced. 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 (Pottinger, sub. 8; Herbert Smith Freehills, sub. 68).

Evidence on the magnitude of problems and the recovery from the GFC is mixed. For example, Inderst (2013) reported that although de-risking strategies by institutional investors have prompted a substantial reduction in asset allocations to equity, there has also been an offsetting shift to holding alternative asset classes such as infrastructure. There is also evidence to suggest that global levels of infrastructure lending have largely returned to pre-GFC levels (chapter 5).

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 determine the appropriate extent of government involvement in financing. There is a substantial body of literature and comment that identifies mispriced risk and excessive levels of lending as one of the *causes* of the GFC (Andersson and Vanini 2009; Beirne and Fratzscher 2013; Debelle 2010).

More generally, the unwillingness of the private sector to commit to higher risk projects may be a commercially 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). This underscores the importance of appropriate institutions and processes for project selection (chapter 7).

Criteria for assessing alternative financing mechanisms

For its analysis, the Commission has adapted the frameworks previously used by Commission researchers in assessing infrastructure mechanisms (Chan et al. 2009) and by the World Economic Forum (2014) in its Infrastructure Investment Policy Blueprint.

Broadly speaking, there are three factors that capture the differences between different financing approaches:

- risk management
- transaction costs
- exposure to market or other disciplines.

Risk management

Risk management is the key determinant of the efficiency of the financing mechanism. As noted earlier, one of the main impediments to greater private financing raised by participants was the high risk of the investment. Similarly, the alternative financing mechanisms proposed by participants, although differing in their mechanics, generally pursue the same goal — allocating the project risk between the parties.

As a matter of principle, an efficient financing arrangement would allocate risks to the party best able to assess, manage and price them. At a high level, the initial choice comes down to whether the risks are best assumed by the government or the private sector. Some of the risks are more amenable to management by one party than the other, and in other cases it is optimal that risk is shared between parties (table 6.2).

Beyond that, different *types* of finance are associated with different incentives to manage particular types of risk. Several participants argued that early involvement of longer-term equity financing creates stronger incentives to manage the project's lifetime risks, than shorter-term debt financing that typically dominates in the early stages of greenfields projects.

Table 6.2 **Simplified illustrative risk allocation matrix**

Phase	*Risks*	*Example risk drivers*	*Potential risk owner*	
			Investors	*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 and availability	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 e.g., earthquakes, flood, hurricane, civil war, riot, crime, strike		✗

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

Transaction costs

Transaction costs include the cost of contracting, arranging and managing finance, and costs associated with delay or uncertainties 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 have been identified by some participants as a barrier to participation in infrastructure investments.

Exposure to market or other disciplines

The choice of financing mechanism can affect investment discipline through enforcing government fiscal responsibility and governance, or through introducing market scrutiny to the investment (Chan et al. 2009).

In terms of government fiscal responsibility and governance, key attributes are the instrument's transparency and exposure to Parliamentary and public scrutiny. In this context, on-budget mechanisms generally have the advantage. Off-budget financing mechanisms places greater pressure on other governance structures, such as for example, Ministerial and regulatory oversight of Government Trading Enterprises (Chan et al. 2009).

In terms 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 this is sending to market participants. Instruments issued by the government on the terms that reflect the risks and costs of the projects rather than the risks of the sovereign are generally to be preferred. Furthermore, where the private sector is involved, the financing should leave at least some risks with the private investor to avoid moral hazard problems.

6.2 Assessment of alternative financing mechanisms

Mechanisms discussed by participants

Participants raised and discussed various financing mechanisms (table 6.3).

Table 6.3 **Alternative financing mechanisms**

Category	*Potential mechanism*	*Participant(s) who raised/discussed*
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)
Targeted payments and government loans	Targeted capital contributions, Phased government grants	Victorian Government (sub. 81)
	Concessional Loans	DIRD (sub. 64)
	Subordinated Debt	DIRD (sub. 64)
Infrastructure bonds	Tax preferential infrastructure bonds	HIA (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)
Mechanisms to address superannuation fund liquidity issues	Super fund senior debt facility	Maritime Super (sub. 60)
	Liquidity guarantee	CBUS (sub. 67); ISA (sub. 60)
	Liquidity pool mechanism	CBUS (sub. 67); ISA (sub. 60)
Availability payments	Use of availability payments	Victorian Government (sub 81); ISA (sub. 60), Bianchi and Drew (sub. 33); AMP Capital (sub. 86); Chris Hale (sub. 2)
Financing from brownfield infrastructure sale proceeds	Capital recycling model	Consult Australia (sub. 23); Committee for Melbourne (sub. 30); Bianchi and Drew (sub. 33); CMEWA (sub. 36); Katz (sub. 45); Lend Lease (sub. 46); Westpac (sub. 51); PCA (sub. 53); BCA (sub. 39); AIG (sub. 47); The Australia Institute (sub. 85); AMP Capital (sub. 86)
Mechanisms to improve the procurement process	Inverted bid procurement model	ISA (sub. 60); CBUS (sub. 67).

The Commission has assessed the various financing options proposed in the course of the inquiry against its framework.

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.

Participants' views on rationale and benefits of guarantees

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 the taxpayer.

First, guarantees require government to take on substantial contingent liabilities. Unless a guarantee scheme was appropriately structured (such as with appropriate arms-length commercial pricing), 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).[10] 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.

Third, while many participants have noted the reduced activity in the commercial credit re-insurance market, there may be indications that the commercial monoline market is beginning to re-emerge in some instances (Herbert Smith Freehills, sub. 68; Assured Guaranty, sub. 29). 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. Thus, it is not clear that the current absence of commercial credit enhancement facilities for greenfield infrastructure projects can be considered a 'market failure' within infrastructure financing markets, to justify governments establishing a replacement facility.

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 6.1). 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.

10 However, because contingent liabilities have a greater than zero chance of being realised, some will have a direct cash impact on the government budget. For example, if the total contingent liabilities were $100 million, with a 40 per cent probability being realised, the expected budget impact will be $40 million.

Box 6.1 **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 debts in relation to the works in order 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.

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: National Audit Office (UK) (2004, 2009b).

Direct provision of finance — targeted payments and government loans

An alternative to mechanisms that seek to facilitate private financier involvement through the transfer of some risk to the government, is direct provision of part of the finance by the government.

The mechanisms proposed by participants that fall into this category are:

- targeted capital contributions (grants)
- government debt/loans.

Participants also discussed potential ways of administering the funding including:

- some form of government-established 'infrastructure bank' which provided loans (and other forms of credit enhancement) to eligible infrastructure projects on an arm's 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).

Targeted payments — details of the instrument

Targeted capital contributions could involve the Australian, or State and Territory Governments making a targeted (and partial) capital contribution 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). Further, targeted capital grants could be made by the Australian Government to state/territory governments, or by state/territory governments to a private sector project proponent.

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 in order to avoid the potential increase in liabilities on the Victorian Government balance sheet that may occur if the Commonwealth funding is passed through the State.

Gold Coast Rapid Transit — A contribution of 45 per cent of the total capital costs was provided to the PPP operator during the construction period.

NSW Convention Centre — A contribution of a percentage of the capital cost was provided to the PPP operator post completion.

Canada Infrastructure Ontario project — A contribution of 30-80 per cent of the projects' costs was made post completion.

Canada British Columbia projects — A contribution 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 would involve 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 purchase 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, potentially reflecting the government's view that the lifecycle project risks are lower than the market's assessment (DIRD, sub. 64).
- 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). The loan could involve a government 'risk premium' given that it sits below senior debt but ahead of equity.
- Various other forms of debt are possible; such as a portion of senior debt from commencement of project, a portion of senior debt 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).

Participants' views on direct provision of finance

A common theme in participants' views on government co-provision of finance, irrespective of the instrument deployed, was that it would reduce the costs to private financiers and allow a project to go ahead that otherwise would not because the full balance of private finance cannot be raised in the current market (Pottinger, sub. 8 attach.; DIRD, sub. 64). Participants also acknowledged that direct provision of finance by the government in either form involves the government accepting the explicit or contingent costs that would have remained with the private sector had it been the project's sole financier (for example, Victorian Government, sub. 81).

There was limited discussion of the relative merits of direct capital grants and government loans. In particular, some participants argued that government lending could be a more direct response to current impediments to private sector involvement. Specifically, it could be used where infrastructure financing markets

are otherwise issuing short tenor debt, and the Government takes the view that the lifecycle project risk is lower than the debt market's assessment of project risk. For example, the Department of Infrastructure and Regional Development (sub. 64) note that this type of mechanism could be used during the early phases of a project where there is significant construction and early patronage risk. This approach is currently being trialled by the NSW Government in its WestConnex project whereby it will 'fund and take on patronage risks in the first instance and once patronage is established, use the revenue flows to attract private investment to finance the next stage of the project' (OIC, sub. 78, p. 4).

On the other hand, the Victorian Government (sub. 81) favoured a targeted capital contribution approach within the context of a PPP financing structure, because it represents 'minimal intervention' compared to other financing options which would involve government maintaining debt or equity interest within the capital structure of a project. The Victorian Government also argued that government debt raises the potential conflict of the government being the originator of the project and lender to the project (Victorian Government, sub. 81; BCA, sub. 39, attach.).

Commission's assessment

The threshold step for any assessment on the merits of direct government provision of finance should focus on the underlying rationale for government involvement. Both government capital contributions and lending involve a transfer of financial costs and/or risks of a component of the financing to the taxpayer, and the first order question is whether this is warranted on public benefit grounds. To some degree, appropriate project selection and design as well as the decision on the *extent* of government involvement are more important than the form in which finance is provided by the government.

Beyond that, both approaches have significant advantages over less direct instruments, such as guarantees. Specifically, the instruments are a more 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.[11]

11 This is not to deny that the transaction costs of negotiating and enforcing the terms of government involvement per se could be substantial.

Assessed against each other, the two approaches have some advantages and disadvantages.

Targeted capital grants, particularly when administered for projects that would have been undertaken without government assistance, equate to an explicit subsidy. This could encourage unproductive rent-seeking behaviour by private finance providers, as well as place pressure on the government to support projects that would otherwise fail the cost–benefit test. In other words, the mechanism risks creating expectations that any project will be supported, as long as some private finance is available.

On the other hand, the Commission agrees with the Victorian Government that appropriately administered targeted grants could have the attraction of limiting government involvement in the project to a one-off intervention. (This assumes that the government does not subsequently assume more risks.) This approach could involve some administrative cost savings. Also, the explicit grant could be a more direct way of targeting gaps in finance that arise due to the public good nature of the project.

Depending on the terms at which it is offered, government lending could be less susceptible to rent seeking.[12] Furthermore, to the extent that there is market power in private sector lending for infrastructure, as suggested by some participants, there may also be some competitive gains from government involvement in lending or the possibility of such involvement.

On balance, the Commission considers that — assuming other reforms proposed in this report are implemented — there is a role for government support in the form of grants or 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 fill the gaps in private sector finance

12 However, the Commission has in the past found that Government lending was not completely immune to this problem — for example, see PC (2012a).

- 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 (one of these is discussed later in this chapter). Finally, the ability to diversify the risks from government involvement is likely to be greater when those risks are spread across the entire public balance sheet, rather than just the infrastructure class of assets.

None of these perspectives are absolute objections to the concept. Facilities like this are under consideration in the US and 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.[13] International research previously cited by the Commission (2012a) indicates that government ownership of financial institutions is associated with slower subsequent financial development and lower growth of productivity.

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. 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

13 These included the Victorian Economic Development Corporation, the West Australian Development Corporation and the Australian Industry Development Corporation (PC 2012a).

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 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. There are advantages in the provision of government support in the form of transparent grants or loans, as discussed above.

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. Two potential financing mechanisms discussed by participants are:

- government issued infrastructure bonds (and more specifically 'converting infrastructure bonds')
- concessional tax treatment of infrastructure bonds issued by private sector investors or state/local governments.

Converting infrastructure bonds — details of the mechanism

Broadly speaking, the rationale for raising financing 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).

As an alternative mechanism, 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.[14] During the construction phase, bond holders would receive a fixed coupon rate, as would occur in a typical fixed price design and construct contract. 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 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, those gains could be eroded if the government distorts purchasers' incentives through subsidies such as tax advantages (discussed later), or by underwriting the project's risks. To the extent that the government feels obligated to 'bail out' purchasers of these bonds if or when a project fails, it has effectively issued government debt in all but name.

There are also some flexibilities in aligning the design of the instrument to project specifics. For example, the term to maturity of revenue bonds can be designed in a way that matches the expected useful life of the assets in most cases (Fabozzi 2000). Thus, the consumption of services can be broadly matched with payments for those services.

The instrument may also have some perception value with investors and the public 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). However, the benefits of such a perception are hard to assess.

There are also some costs associated with this approach to public debt finance. First, project-specific bonds are likely to come at a higher issuing cost than government debt raised through centralised borrowing agencies (Chan et al. 2009); BCA,

14 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).

sub. 39), in part because of economies of scale in administration and also because a liquidity premium would likely be required by investors. Commission researchers have also previously found that like all bonds, infrastructure bonds:

> … generally lack some of the flexibilities common in institutional lending such as renegotiating repayments and loan restructuring. (Chan et al. 2009, p. 86)

While these inflexibilities can be managed contractually through mechanisms such as call and put provisions, this is likely to add to transaction costs as well as dilute some of the initial gains from the project risk allocation between the private and public sector participants.

The Commission will further investigate the costs and benefits of governments issuing project-specific infrastructure bonds.

INFORMATION REQUEST 6.1

The Commission seeks views on the costs and benefits of governments issuing project-specific infrastructure bonds, with the interest rates reflecting the risks of the project and which explicitly do not have a government guarantee.

With respect to converting bonds, to the extent that they may be an attractive instrument for long-term equity investors, further consideration of the proposal may be justified. However, the Commission has some reservations about their design and operation.

First, until the bond converts, the guaranteed return to holders would be underwritten by government, and the key issue is whether the coupon rate, as well as any contingent liabilities transferred to the taxpayer are commensurate with the risks of the project. Furthermore, the extent to which construction risks can be transferred under a design-build-operate (DBO) contract under this model would depend on factors such as the design and enforcement of the contract, and whether the absence of private financing (as a discipline on construction cost management) undermines this.

Second, the instrument as proposed by participants, would convert to equity upon the completion of construction. 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)[15].

The mechanism could overcome this issue if bond holders are compensated for the early demand risk in negotiating the pre-determined price of equity, but if the risk appetite of the prospective investors is low, this could substantially raise the price of finance. Alternatively, some, or all of that risk could be transferred to the government by postponing the point at which the conversion price is negotiated and the bond converts to equity. For example, the conversion could be timed to occur when the early operational risks have dissipated and the infrastructure project has assumed a brownfield risk profile.

In terms of the budget impact of the instrument, if state government borrowed to fund the DBO contract, this would increase its net debt in the short term (matched against the asset in question). A converting infrastructure bond could provide certainty that this debt would be extinguished on conversion, reducing or eliminating any potential short-term impact on state credit ratings.

Ultimately, the level of market interest in this type of instrument from investors, such as superannuation funds, needs to be tested and the Commission is seeking further views.

INFORMATION REQUEST 6.2

The Commission seeks views on the costs and benefits of governments issuing converting infrastructure bonds to finance greenfields infrastructure investments.

Tax concessions for infrastructure bonds

As an alternative to designing an Australian Government-issued bond financing mechanism, some participants (HIA, sub. 21; Committee for Melbourne, sub. 30) discussed the possibility of a Commonwealth scheme which provides tax

15 As noted in Bianchi and Drew (sub. 33), while conventional thinking suggests that the construction phase of a PPP exhibits greater levels of risk than the operations phase; research finds that the opposite can occur in terms of the risk profile of PPPs. These findings suggest that some PPPs exhibit increasing risk (rather than decreasing risk) as it progresses from the construction phase to the operations phase; particularly as it is at this time that the valuation of the asset can suddenly change when actual traffic statistics do not meet traffic forecasts (Bianchi, Drew and Whittaker 2013).

concessions to infrastructure bond issues by private entities or state/local governments (box 6.3).

Box 6.3 **Participants' views on tax concessions for infrastructure bonds**

The Housing Industry Association (sub. 21) argued that preferential taxation treatment for infrastructure bonds would make them attractive to institutional and self-managed funds, and that the subsidy would constitute a small proportion of total bond issuance.

The Committee for Melbourne (sub. 30) submits that while some have suggested tax preferential treatment for infrastructure bonds, this proposal requires caution. In its view, preferential treatment should only be sought if it will attract new investors who would not otherwise participate, and improve the overall efficiency of financing by providing a cheaper solution. The Committee for Melbourne also notes that mechanisms and resources for oversight of tax-preferred arrangements would also be required to monitor uptake and costs compared with objectives; and that previous attempts with tax-preferred products have resulted in 'poor outcomes'.

Commission's assessment

No submission has raised a convincing argument for introducing tax advantages for infrastructure bonds.

The only policy-relevant rationales that the Commission could identify involve addressing project-related externalities and/or existing distortions in the taxation system which bias against investment in infrastructure compared to other forms of investment.

However, this approach is a relatively blunt and opaque way to deal with biases in the tax system or any project-related externalities. Moreover, at least one of the potential rationales for consideration of tax preferred treatment for infrastructure bonds may in part have been addressed by recent legislative changes. Recent changes to taxation laws now allow 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.[16] This means that even though such losses may be deferred for many years,

16 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

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 6.4).

Box 6.4 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.

(Continued next page)

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 6.4 (continued)

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. (The 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: ACG (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.

Mechanisms to address superannuation fund liquidity issues

A number of participants (for example, Industry Super Australia, sub. 60) argued that greater involvement by superannuation funds in infrastructure financing could generate benefits by providing infrastructure projects with a source of long term capital, which is better matched to the economic life of the asset. One of the barriers to such investment raised by participants is the liquidity obligations of Australian funds, which constrain the ability of those funds to invest in relatively illiquid asset classes, which include infrastructure (box 6.5).

Box 6.5 Liquidity restrictions on Australian superannuation funds

Liquidity restrictions facing superannuation funds are identified as a particular issue in Australia for the following reasons:

- there is a greater reliance on defined contribution schemes in Australia (around 90 per cent of assets) than in other comparable countries, such as Canada (around 5 per cent of assets (Inderst and Della Croce 2013)).
- portability rules allow members to switch funds on 30 days' notice, meaning funds must maintain sufficient liquidity to finance short-term redemptions. While there is no accurate data available on how many members switch funds, it appears to be quite low (PC 2012b). Nevertheless, it is likely that this is a consideration for superannuation funds when deciding to invest
- most superannuation can be taken as a lump sum at retirement which creates a 'cliff' at the end of the accumulation phase; and there is an absence of sufficiently attractive retirement income products such as annuities due to current regulatory impediments
- the industry regulator, the Australian Prudential Regulation Authority remains cautious about the holding of illiquid assets in the prudential guidance that it issues (IFWG 2012).

Defined contribution systems are more open-ended than defined benefit systems, and hence are more affected (BCA, sub. 39 attach., p. 39; Inderst and Della Croce (2013)).

The development of alternative retirement income products has been previously identified as a potential way of addressing these liquidity constraints. The IFWG (2012) found that there are limitations on the type of alternative products that superannuation funds can hold in the members' post retirement years. Currently, retirees can take a lump sum payment, a pension or an annuity.

Some participants have suggested mechanisms to deal with this liquidity issue.

Specific details of the mechanisms

Potential mechanisms raised by participants include:

- A government liquidity guarantee for superannuation funds regulated by the Australian Prudential Regulation Authority (APRA) similar to the deposit guarantee scheme provided to Authorised Deposit-Taking Institutions (ADIs)[17] following the global financial crisis (Industry Super Australia, sub. 60; CBUS, sub. 67).

17 ADIs are banks, building societies and credit unions which are prudentially supervised by APRA.

- 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 guaranteed rate of return (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.

Participants' views on addressing superannuation fund liquidity issues

One of the benefits identified by participants is that measures to encourage a greater level of investment by superannuation funds in infrastructure could, in turn, provide a new source of competition to the current reliance on bank debt of shorter tenor for greenfields projects. As noted, several participants observed that in the absence of a monoline insurance market in Australia, this infrastructure financing market has to a large extent been dominated by banks; which has in turn made sourcing finance at an appropriate cost and tenor much more challenging than prior to the global financial crisis (BCA, sub. 39; Lend Lease, sub. 46; Victorian Government, sub. 81; OIC, sub. 78, attach. J). By contrast, it is argued that superannuation funds generally have longer term investment horizons (although this depends on the age profile of their members).

One participant noted that addressing the liquidity restrictions directly could free up further appetite for illiquid investment amongst superfunds, whilst being prudently counterbalanced by sole purpose obligations and increased costs of investment through the fee imposed on the guarantee or the cost associated with accessing the liquidity pool (CBUS, sub. 67).

Commission's assessment

The primary objective of superannuation funds is to provide benefits to its members on their retirement. As such:

> … funds must invest on behalf of members to maximise returns. This means investing in a range of assets that meet the risk/return profile required to achieve this goal and includes investment in Australian and international equities, infrastructure, commercial

> and residential property, bonds and deposits. Superannuation is not a cash cow to fund particular economic ills in Australia. (EY 2014, p. 1)

It has been argued that any change to liquidity requirements for superannuation should not conflict with superannuation funds' fiduciary obligation to act in the best interests of their members (EY 2014). Moreover, 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.

Thus, specific characteristics of the Australian superannuation system are likely to be playing a role in making many funds cautious to invest more heavily in infrastructure. That said, Australian superannuation funds already have relatively high average asset allocation to infrastructure, and can invest in infrastructure assets through a range of channels — particularly in mature brownfields assets — either directly, or through pooled open-ended unlisted infrastructure funds and various index funds.

Moreover, 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). More generally, infrastructure funds have an incentive to optimise their portfolio between different asset classes, with liquidity being one of the considerations. The effect of any regulatory distortions that push superannuation funds towards greater than optimal liquidity could also be mitigated by the emergence of market-based solutions (such as listed funds), provided the demand exists for such solutions.

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 its appetite for investments in infrastructure. This includes a continuing trend toward consolidation within the superannuation industry (particularly the industry sector) (PC 2012b).

There is also no direct link between the availability of a liquidity facility and increased investment in greenfield infrastructure assets. The ultimate objective of superannuation funds is to provide returns to members. While investment in infrastructure assets can deliver an appropriate risk-weighted return for superannuation fund members, it is just one of many asset classes, and it cannot be assumed that investment in infrastructure assets will always be appropriate.

Issues around how such a scheme would be designed could also prove problematic. There was limited information provided by participants on the potential design of such a facility, and the Commission will seek more information during public hearings.

An Infrastructure Debt Authority under the model proposed by Maritime Super may create interest in debt investment by superannuation funds. However, it would also carry the weaknesses of a Government-owned infrastructure bank detailed earlier. There is also a risk of moral hazard in the decisions of superannuation funds. The facility would have the effect of a 'put option' which would dull the incentives for the fund to appropriately assess and manage risk.

Ultimately, the Commission agrees that the liquidity constraints affecting superannuation funds may warrant consideration by policy makers. However, liquidity facilities per se appear to offer more risks than they address. The issue is a systemic one and hence best addressed by any future systemic review.

Extending RBA repo eligibility

Currently, the Reserve Bank of Australia (RBA) enters into repurchase agreements ('repos') with private securities issued by 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.[18]

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, box 6.6) has proposed that RBA should extend its current repurchasing agreement arrangement activities to support debt instruments issued for eligible PPP projects. Under the proposed mechanism, a debt security issued to finance a PPP in Australia, carrying a financial guarantee from a

18 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).

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.

Box 6.6 Participants' views on extending the RBA repo eligibility

In proposing the instrument, Assured Guaranty argued:

> 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, 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)

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.

The RBA currently only deals with securities rated lower than AAA if they are issued by APRA-regulated ADIs. Under the proposed mechanisms, 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), and would price any uncertainty into its expected risk-adjusted return for the repurchase price.

Ultimately, while the instrument would target an identified impediment to private sector finance, the costs of implementation may outweigh the benefits. The Commission is not convinced on the case for an extension of RBA repos, but will consult with the relevant parties and investigate this proposal further for its final report.

Capital recycling

Capital recycling has been proposed by a wide range of participants 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 6.7), and has been the subject of widespread discussion by participants and in the broader policy discourse.

One of the key barriers to greater use of capital recycling relates to state government concerns about the potential loss of revenue from their existing infrastructure assets. To overcome this, various incentive mechanisms have been suggested. This includes the Commonwealth 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 by some participants (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 mechanism to encourage capital recycling is the use of a tax increment financing mechanism that would enable a portion of the increased Commonwealth 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).

Box 6.7 **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.
- *Legacy Way Project*: The Brisbane City Council mostly funds infrastructure through rates and charges collected from the community and from Federal and State grants and contributions. However, the Council is in the process of asset recycling, by long-term leasing of the tolling rights for the Go Between Bridge and Legacy Way to Queensland Motorways Holdings Pty Limited and QIC Limited. This will release capital to fund new assets.

Sources: BCA (sub 39, attach.); Council of Capital City Lord Mayors (sub 73); Hill (1997); NSW Treasury (nd).

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). Another participant argued that even though the funds raised are technically equivalent to borrowing (given the raised funds are fungible) state governments sometimes suffer from unexpected sharp shifts in their cost of

borrowing caused by information imperfections in the market. This may make it desirable for governments to act as if they faced a ceiling on acceptable debt levels, which in turn constrains the size of their balance sheet (Ergas, sub. 87). A contrary view would be that such a constraint is a high price to pay for managing poor information and the problem should perhaps be addressed directly.

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 submitters 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).[19]

Infrastructure Australia has also estimated that the proceeds to government from the transfer of certain identified candidate assets would be greater than their retention value (OIC, sub. 78, attach. C). [20]

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 greenfield 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.

19 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.

20 In the analysis, the estimated proceeds from selling 30 publicly owned infrastructure assets ($92 billion) exceed the NPV of future dividends ($28 billion), with the surplus available to fund new infrastructure. The analysis was based on examining the dividends received for each of the 30 publicly owned infrastructure assets in Australia, with the cash flows from future dividends discounted by an assumed 12 per cent return on equity. The analysis noted that a risk-free bond rate would not reflect the substantial additional risk these government infrastructure businesses bring to public sector balance sheets.

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.

It is also notable that participants have expressed the view to the Commission that there is a contradictory view in the public mind. On the one hand, there is a perception that increasing debt to buy infrastructure should be avoided. Yet, on the other hand, it is also considered undesirable for a state to sell an asset and use the proceeds to reduce debt. This perception is ultimately about what is valued: which for consumers is service provision, not the way it is financed.

Commission's assessment

Capital recycling involves the linking of two very 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. A potential follow-on risk 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.

There are other potential costs and risks to consider with the use of capital recycling. On the privatisation side of the equation, there is the issue of 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.

There are also risks with the use of tax equivalent payments as an incentive for state governments to engage in privatisation. Calculating the tax equivalent payment could be difficult and its existence could encourage distortionary tax strategies as part of pre-privatisation development by the recipient government. Depending on the structure chosen, it could also provide post-privatisation tax benefits that would result in competitive neutrality issues in markets with a mix of private and public firms, or where competitive entry was desirable.[21]

Finally, from a budget perspective, the net impact on the government's balance sheet through the use of capital recycling is unclear. In effect, government would essentially be swapping ownership of a mature asset (with known demand and cost characteristics), for ownership of a new (and potentially more risky) greenfields asset (with 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 government-owned assets and invest in new infrastructure should be separate. There may be merit if there are genuine public benefits in linking a particular sale and purchase, but it should not be normal practice.

Availability payments — modifying the traditional PPP model for economic infrastructure

One of the main 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

21 This could occur if the tax equivalent payment was delivered to new owners over the life of the asset.

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).

Specific details of the mechanism

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, particularly in funding social infrastructure (IFWG 2012). More recently, the availability payment PPP model has been adopted 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.)

Commission's assessment

Like several other ways of facilitating private sector financing that have been canvassed in this chapter, availability payments are essentially a mechanism for transferring risk from the financier to the government. 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 and provided projects are appropriately selected and well-structured and the 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, have as their catalyst an overly optimistic assessment by private consultants of

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.

likely patronage. The most important contribution from government in this area is to ensure that its provision of information is accurate and fulsome.

That said, the approach may represent a more efficient allocation of project risks where the government is better placed 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. 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] Availability payments may also be used to fund the 'public benefit' aspects of infrastructure that could not be readily recovered from users.

On the other hand, if they are not administered appropriately and 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 trade-offs 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 cost-effectiveness and quality of service provision). 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 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.

23 Water desalination plants are one example of this scenario.

A proposal to overcome the high cost of finance procurement — the inverted bid process

As noted in section 6.1, the high costs of procuring finance are seen by participants as a significant barrier to the involvement of longer-term equity providers in greenfields projects. Industry Super Australia (sub. 60) and CBUS (sub. 67) have argued that early involvement of long-term equity financiers would improve incentives to design the project to minimise operations and maintenance costs, and to price patronage risk more accurately than short-term finance, as well as reduce the financing transaction costs over the life of the project by reducing the need for refinancing.

Consequently, they proposed an 'inverted bid process' to increase the role of long-term equity finance in greenfields projects (box 6.8).

Box 6.8 Elements of Industry Super Australia's 'inverted bid process'

- The government could appoint a long-term equity fund manager to work with it on a project, or have several pre-qualified funds.
- The parties would negotiate, on an open-book basis, an agreed base case internal rate of return (IRR) over the construction and other costs of the project for a portion of the equity.
  - Long-term equity's IRR would be guaranteed by the government, and this may include upside and downside risk-sharing with the government.
- Once the government has contracted with long-term equity for this IRR, long-term equity would be responsible for obtaining tenders for residual finance, construction, and operations and maintenance.

Source: Industry Super Australia, sub. 60.

The Commission has provided a preliminary assessment of the proposal, which is discussed below.

Implementation issues

Risk

The inverted bid process proposed by Industry Super Australia (sub. 60) and supported by CBUS (sub. 67) involves the government guaranteeing an internal rate of return (IRR) to a long-term equity provider (such as a superannuation fund). The government could also enter into a gain-share/pain-share arrangement with long-term equity. Guaranteeing an IRR, or risk-sharing between the government

and long-term equity, reduces the risk borne by long-term equity and transfers it to the government.[24] Under either of these arrangements, the government would, in effect, be undertaking to make a payment to long-term equity to compensate for any shortfall in returns.

The key issue is the extent of this risk transfer. Providing a guaranteed rate of return reduces long-term equity's incentive to perform efficiently, as long-term equity will have less 'skin in the game' and may even lead to moral hazard. Indeed, if the rate of return is fully guaranteed by the government and the risk fully divested from the equity financier, the risk management advantages of involving equity disappear and the government would be better to provide the equity itself. Further, the tender participants would essentially be bidding on their required 'risk free' rate of return, which would remove any market signalling benefit to the government from involving the private financier.

Thus, for the inverted bid process to be a viable procurement option, the risk sharing arrangement, whereby at least some of the risks remain with the financier, needs to be prescribed before the process commences. One way to achieve this is the pain-share, gain-share clauses mentioned above. Another is to convert the winning IRR bid into an agreed revenue equivalent before the project commences, and to guarantee the revenue payment rather than a rate of return.[25]

Appropriate involvement of long-term equity early in the project has the potential to reduce costs of financing, particularly transaction costs associated with refinancing the project. However, one practical problem with Industry Super's proposal for equity to bid on a rate of return *for a proportion of equity* is that the rate of return experienced by equity depends on the proportion of equity in the project. The debt to equity ratio of the project affects the relative risk borne by each financier, and hence their individual rates of return. (It does not, however, affect total project risk.) If the inverted bid model was implemented, it would be more feasible to have long-term equity bid for the rate of return given the risk of the *entire project*, and then subsequently allocate the risk between debt and equity.

Procurement

Under the inverted bid process model put forward by Industry Super Australia (sub. 60), the IRR for long-term equity is negotiated before the other parties to the consortium are involved. This could be under a 'preferred bidder' model governed

24 This is consistent with the experience in Scotland, where equity has been replaced with subordinated debt, and the residual risk that would otherwise have been borne by equity has been shifted to the government (SFT 2011).

25 This approach would have similarities with the Regulated Asset Base model used in Australia.

by guidelines similar to those used by the Victorian Government for unsolicited bids. This has some potential implications.

First, there is the risk of expected costs changing between the time the government and long-term equity agree on compensation, and when the other consortium partners are involved and the project has been specified in more detail. For example, under the UK procurement model,[26] it is necessary to specify the project in some detail before being able to properly price long-term equity.

The inverted bid process also envisages that construction companies will bid against each other under terms set by long-term equity. Under this model, long-term equity is acting as a 'bid sponsor' instead of an investment bank. This is argued to reduce the fees charged by traditional intermediaries, but it is important for long-term equity to ensure it has adequate expertise before performing this role.

Further, running an individual construction tender means that no one consortium will tender for all the elements of the PPP contract. This may give long-term equity enhanced buying power, and lead to some contracts being more competitively priced, but it is important to retain the benefits of consortiums, such as risk-sharing and economies of scale. While breaking up consortiums might reduce duplication of costs across multiple bidding groups, these are a small percentage of the total contract price.

Finally, it is important that any requirements for preferred bidders do not create unnecessary barriers to entry. Competitive tendering for the IRR is likely to lead to a more competitively priced rate of return.

Nevertheless, the Commission considers there is merit in further examining ways of involving long-term equity at an earlier point in financing public infrastructure. To that end, the Commission seeks feedback on the benefits and costs of procuring a larger proportion of long-term equity finance earlier on in the project, having regard to the issues discussed above.

26 In the United Kingdom, long-term equity submits a tender after the preferred bidder is announced, but before financial close. The UK Government is a minority equity co-investor (which provides risk−return sharing), and also provides debt guarantees to further reduce the cost of long-term equity finance (HM Treasury (United Kingdom) 2012).

INFORMATION REQUEST 6.3

The Commission seeks feedback on the advantages and disadvantages of alternative procurement processes focused on long-term equity, such as an 'inverted bid' model. In particular, the Commission is interested in how an alternative procurement process should be designed to maximise efficiency gains and the likely benefits and costs of such an approach.

7 Improving governance and institutional arrangements

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.
- If governance and decision-making processes are not reformed, more spending will simply magnify the cost of poor project selection.
- Institutional arrangements for the provision and delivery of public infrastructure should incorporate good governance arrangements that include:
  - effective processes for planning and selecting public infrastructure projects, including rigorous and transparent use of cost–benefit analysis, public consultation, and public reporting of decisions
  - principles and processes for selecting funding and financing arrangements
  - independent evaluation of the performance of public infrastructure projects.
- In many sectors of economic infrastructure, project selection is strengthened through privatisation or corporatisation subject to good governance frameworks. Effective pricing or user charging plays a central role in strengthening project selection. In sectors with limited pricing signals, or an absence of pricing mechanisms, there is a greater need for robust governance frameworks to ensure the efficient provision and delivery of public infrastructure.
- There is scope to improve decision-making and governance arrangements by moving towards alternative institutional models, particularly in the roads sector.
- There are current efforts to adopt a more commercial approach to the provision of road services for heavy vehicles. While this reform process is a good start, there is also scope to consider alternative institutional models to improve outcomes in the funding and provision of roads for cars and other light vehicles. This includes the adoption of a road fund model or a regulated public road agency model.
- Achieving reform in the road sector requires community acceptance of road user charging schemes. The reform process is likely to be a long journey, requiring significant commitment and effort from all levels of government to build public support. This is not dissimilar to the long process that built bi-partisan support for trade liberalisation.
- One approach to strengthen incentives to adopt improved governance arrangements for public infrastructure is to make the Australian Government's assistance for public infrastructure conditional on Local, State and Territory Governments complying with the set of good governance principles and policies set out in the package of recommendations in this report.

As discussed in chapter 2, the process of project selection is crucial to the efficiency of public infrastructure provision. This involves not only the role of transparent cost–benefit analysis, but also the governance and institutional arrangements that guide the selection and delivery of public infrastructure projects.

The purpose of this chapter is to consider the scope for institutional and governance reform to improve the efficient provision and delivery of public infrastructure services, with a focus on options for alternative institutional arrangements specifically for the roads sector.

The Commission is also proposing an approach by which the Australian Government could use its influence and role in the funding of public infrastructure to impose greater discipline on the provision, funding and financing of public infrastructure.

7.1 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 for public infrastructure could improve outcomes for the community in the provision and delivery of infrastructure services. These areas are outlined below. Although the package of reforms outlined in this report could be adapted for application across public infrastructure sectors, they are particularly relevant to the roads sector. Accordingly, this chapter is focused largely on achieving better outcomes in the provision and delivery of road infrastructure.

Project selection (chapter 2)

There are numerous examples of inferior project selection and inadequate assessment of the costs and benefits of public infrastructure projects. Evidence from Australia and internationally suggest there can be significant differences between ex ante and ex post estimates of the costs and benefits of major public infrastructure projects. In particular, government decisions can become politicised and may be based on inadequate information and assessment of the costs and benefits of projects, especially where projects are pre-election commitments made from government or opposition.

Inferior investment decisions are not unique to governments. The private sector can also make mistakes regarding investment decisions. However, when the government makes mistakes regarding large public infrastructure projects, the consequences are felt more broadly by the community and taxpayers, often for long periods of time.

The public can be left with a lasting legacy — poor infrastructure in the wrong location with a significant impact on the government balance sheet. Such decisions can, and do, crowd out the provision of better infrastructure projects.

Project delivery (chapters 3 and 11)

The use of public private partnerships (PPPs) can contribute to improved efficiencies in the delivery of some types of public infrastructure. However, achieving better outcomes depends on the policy and regulatory frameworks put in place by governments, the effectiveness of risk allocation, as well as the existence of well-established user charging arrangements. In cases where user charging is impractical, governments may need to fund private sector provision of public infrastructure services wholly or partially.

A number of inquiry participants have suggested that public sector agencies lack the capability and capacity to identify and allocate project risks and to manage contractual relationships with the private sector for the procurement of public infrastructure. In some cases, governments have also come under pressure (and have succumbed to this pressure) to provide assistance for privately provided public infrastructure projects even though risks were contractually allocated to the private sector.

Funding arrangements (chapter 4)

There is a disconnect between the revenue that governments collect from road users through taxes and charges, and expenditure on road infrastructure. Furthermore, the revenue from taxes and charges often goes into consolidated revenue, rather than directly to road authorities, or it is hypothecated to road authorities in ways that do not provide a clear incentive to supply services to users that generate revenue. As a result, investment in roads is often subject to political pressures arising from annual budget processes and election cycles. This leads to challenges in undertaking coherent long-term planning and investment in road infrastructure. These observations may apply to other infrastructure sectors as well.

Government funding of public infrastructure is complicated by the vertical fiscal imbalance under Australia's federal system, which gives rise to significant transfers from the Australian Government to the states and territories to finance and fund some infrastructure. This fiscal transfer is appropriate, as the Australian Government generally has a more efficient tax base (levied through broad-based taxes on income and consumption) than State and Territory Governments. However for historical and constitutional reasons, the states and territories invest more

heavily in public infrastructure than does the Australian Government. It is also appropriate for reasons related to the subsidiarity principle, in that those levels of government closest to the community are more likely to have the information and incentives to invest in the types of infrastructure the local community values. That said, vertical fiscal imbalances can mute these incentives.

Financing decisions (chapters 5 and 6)

Governments have access to a broad range of funding mechanisms and are seeking to use these to encourage greater private sector financing of public infrastructure. Although mechanisms can be designed to encourage greater levels of private sector financing, often these involve transferring significant risks and costs to the government (and ultimately to taxpayers). Further, although the use of private financing may change the short-term budget outlook for governments, it does not necessarily change the intertemporal effects (putting aside potential efficiency gains from private provision). Thus, it is imperative that government financing decisions are transparent and appropriately weigh up the full range of costs and benefits of all options.

Many of the issues outlined above stem from deficiencies in the institutional and governance arrangements underpinning the provision, funding, financing and delivery of public infrastructure. There is evidence (as outlined in other chapters) of inadequate and opaque cost–benefit analyses, overly optimistic demand forecasts, insufficient assessments of project risks, and inappropriate allocation of project risks between public and private partners. Inquiry participants have also raised a number of concerns relating to governance and institutional arrangements for public infrastructure (discussed later in this chapter). These include insufficient long-term planning and coordination for public infrastructure, suboptimal project governance and governments' bias towards large projects. In the Commission's view, the current institutional and governance arrangements have contributed to poor outcomes for the community.

DRAFT FINDING 7.1

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

The Commission considers that adoption of good practice governance principles and reforms to institutional arrangements would assist in promoting greater efficiencies in the long-term planning, provision, funding and financing of public infrastructure.

Corporatisation and privatisation of public infrastructure in Australia has generally occurred in those sectors where well-established direct user charging arrangements are in place. GTEs and privatised entities can deliver good outcomes because they are essentially run as commercial businesses with revenue sourced primarily from user charges and other pricing mechanisms with limited recourse to the public balance sheet. This creates strong incentives for good project selection and efficient delivery of infrastructure. Privatised entities have a greater incentive than GTEs as they are subject to capital market discipline (that is they are exposed to the threat of takeover or market assessment of funds manager performance) and generally do not not have a government guarantee.

The proposed reforms outlined in chapter 2, relating to privatisation of some remaining publicly owned infrastructure, would improve the efficiency of public infrastructure in some sectors. However, there is also scope for governance and institutional reform in sectors where markets do not exist or are incomplete, especially for roads. That said, the greater the dependency of public infrastructure services on government funding sources, the more challenging the design and implementation of good governance arrangements will be.

7.2 Principles for good governance

Strong and effective governance arrangements are fundamental to achieving efficient provision and delivery of public infrastructure services to the community. They play an important role in creating improved 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 provide valuable information from which lessons can be learned from past failures and successes and this can further improve project selection and management over time.

It is useful to articulate a set of governance principles by which existing arrangements can be assessed and through which improvements can emerge. There are many formulations of good governance and no universal set of principles that can be applied to improve performance in all infrastructure sectors. However, generally accepted elements of good governance relate to the accountability and transparency of public sector decision makers and their capabilities (box 7.1).

Box 7.1 Some principles of good governance

Accountability and responsibility

Accountability can be achieved through a process whereby decision-makers are 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, responsibility for procuring public infrastructure rests with either a government department (such as departments of infrastructure, health, and education) or a stand-alone government body (such as a GTE). 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 the performance of those agencies and Ministers and the extent to which the agencies and Ministers can be held accountable for outcomes.

Transparency

Transparency is required to ensure that the community can have confidence in 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, it can be facilitated by making cost–benefit analysis and project selection criteria publicly available, as well as through regular performance monitoring, reporting and periodic performance reviews.

Capability

Government entities require appropriate resourcing 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 infrastructure projects.

Sources: ANAO (2003b); PC (2011a), (2013a).

Ideally, decisions relating to the provision, funding and financing of public infrastructure would be based on an objective consideration of costs and benefits, and would not be subject to politicisation or undue influence of any one stakeholder or group. Decisions should be objective and fully focused on providing the highest possible net benefits to the community. In principle, this can be facilitated by clearly defining the roles and responsibilities of elected representatives (which may relate to 'public interest' or policy considerations) and of those entities charged with making investment decisions and delivering infrastructure services, and by making

these entities accountable for the outcomes achieved. Although it might be desirable to create a degree of independence of public sector agencies from day to day political pressures, governments still play an essential role by setting desired objectives, outcomes, policy frameworks and decision-making processes. In practice, however, some degree of tension is likely to persist. This is a consequence of the necessary role that governments play in public infrastructure.

DRAFT RECOMMENDATION 7.1

Institutional arrangements for the provision and delivery of public infrastructure should incorporate good governance arrangements, including:

- ***the principal objective of ensuring that decisions are undertaken in the public interest***
- ***clear and transparent public infrastructure service standards***
- ***effective processes, procedures and policy guidelines for planning and selecting public infrastructure projects, including rigorous use of cost–benefit analysis and transparency in cost–benefit assessments, public consultation, and public reporting of the decision (including a transparent review of the decision by an independent body, for example, an auditor-general or Infrastructure Australia)***
- ***efficient allocation and monitoring of project risks between government and the private sector***
- ***use of transparent and competitive processes for the selection of private sector partners for the design, financing, construction, maintenance and/or operation of public infrastructure***
- ***sufficiently skilled employees who are responsible and accountable for performing their functions***
- ***principles and processes for considering funding arrangements, including application of user-charging as the default funding arrangement where this is appropriate, and transparency of funding decisions (including public reporting of decisions and periodic review by an independent body, for example, an auditor-general or Infrastructure Australia)***
- ***principles and processes for selecting efficient financing mechanisms and transparency of financing arrangements***
- ***performance reporting and independent evaluation of public infrastructure project performance.***

It is the role of governments (elected representatives and agencies) to create the conditions necessary for institutions and governance arrangements to operate effectively with a long-term focus. Regardless of the specific institutional design

adopted, strong and effective governance arrangements promote the achievement of better outcomes from all decision makers responsible for public infrastructure. To this end, it is important that each government commit to, and support, appropriate institutional arrangements, particularly when alternatives might be politically expedient.

DRAFT FINDING 7.2

For the proposed reforms to institutional and governance arrangements (draft recommendation 7.1) 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 not politically expedient. The proof of that commitment lies in rejecting projects that have obvious 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.

7.3 Current institutional arrangements for infrastructure provision

As discussed in chapter 2, there is a range of different institutional and governance arrangements at the Australian, State and Territory and Local Government level for infrastructure provision. These vary by sector and depend on the bodies responsible for investment and service delivery. Broadly speaking, investment decisions can be made by:

- a Minister or government department or agency with delegated responsibility
- a Minister with responsibility for management or delivery of infrastructure appointed to a statutory authority
- a government trading enterprise (GTE), with or without economic regulation
- the private sector, with the infrastructure service possibly subject to economic 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 the approval of cabinet or the relevant council, typically the Minister would put forward proposals developed by the relevant government department. The responsibility for delivering the public infrastructure service may lie with a government department or other 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 MainRoads).

Most state governments have established specialist units within government departments to identify and provide advice to Ministers on project selection and the delivery of priority public infrastructure. In some jurisdictions, specialised units have been established in government departments to assist with the procurement and delivery of infrastructure. For example, Projects Queensland prepares evaluations of projects with potential to be delivered as PPPs and manages the tender processes and contract negotiations for approved projects.

In other infrastructure sectors, such as urban water and energy, GTEs are responsible for investment decisions and supply of services, although they vary in terms of the tasks they perform and their accountability to ministers and the government. For example, some 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 time of use tariffs). Further, in some instances, governments have made project selection decisions themselves, even though a GTE is responsible for delivering services.

Private sector involvement can involve the government taking decisions to invest in projects and then contracting with one or more private firms to deliver the infrastructure (for example, the construction of toll roads). There are various models of private sector involvement in the delivery and operation of road infrastructure, such as traditional design and construct models and PPPs (chapters 3 and 11). In the case of a private business, the government may grant a concession or regional monopoly. Alternatively, government may privatise entities under an appropriate regulatory framework. This framework may set service standards or allowable prices and devolve responsibility for investment and financing decisions to the privatised entity.

Coordination and planning mechanisms

Some project proposals may involve multiple levels of government, in particular where there are inter-jurisdictional spillovers, areas of joint Commonwealth-State responsibility, or the decision to proceed with a project is dependent on Australian Government funding. There are several existing mechanisms through which different levels of government seek to coordinate decision making around the planning and provision of public infrastructure, for example:

- The Council of Australian Governments (COAG) Standing Council on Transport and Infrastructure (SCOTI) provides a forum for collaboration between the Australian, State and Territory and New Zealand Ministers and the Australian Local Government Association.

- 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 in 2008.
- COAG has sought advice on major transport reforms, including current proposals for Heavy Vehicle Charging and Investment (HVCI) reform.
- The National Water Initiative was agreed by COAG in 2004 to achieve a more cohesive national approach to the way Australia manages, measures, plans for, prices, and trades water, leading to the establishment of the National Water Commission to oversee water reform progress.

At the national level, Infrastructure Australia (IA), was established in 2008 to provide advice to governments, investors and infrastructure owners on matters including:

- Australia's current and future infrastructure needs
- mechanisms for financing infrastructure investments
- policy, pricing and regulation, and their effects on investment and on the efficiency of the delivery, operation and use of national infrastructure networks (box 7.2).

Funding for the Australian Government's current 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 usually prior to the commencement of the program for assessment by the Commonwealth against strategic priorities, including whether they are listed on Infrastructure Australia (IA)'s priority list and economic viability criteria (DIRD, sub. 64). In developing national infrastructure audits and priority lists, IA has primarily relied on submissions from state governments. However, the Department of Infrastructure and Regional Development commented that there has at times been a disconnect between IA's priorities and state government strategic plans.

The Australian Government has proposed a number of reforms to the role of IA as set out in the Infrastructure Australia Amendment Bill 2013. Some elements of the proposed changes, 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.

Box 7.2 **Infrastructure Australia's functions**

The *Infrastructure Australia Act 2008* (Cwlth) s.5, specifies Infrastructure Australia's functions as:

(1) Infrastructure Australia has the primary function of providing advice to the Minister, Commonwealth, State, Territory and local governments, investors in infrastructure and owners of infrastructure on matters relating to infrastructure, including in relation to the following:

(a) Australia's current and future needs and priorities relating to nationally significant infrastructure;

(b) policy, pricing and regulatory issues that may impact on the utilisation of infrastructure;

(c) impediments to the efficient utilisation of national infrastructure networks;

(d) options and reforms, including regulatory reforms, to make the utilisation of national infrastructure networks more efficient;

(e) the needs of users of infrastructure;

(f) mechanisms for financing investment in infrastructure.

(2) Infrastructure Australia has the following additional functions:

(a) to conduct audits to determine the adequacy, capacity and condition of nationally significant infrastructure, taking into account forecast growth;

(b) to develop lists (to be known as Infrastructure Priority Lists) that prioritise Australia's infrastructure needs;

(c) to review and provide advice on proposals to facilitate the harmonisation of policies, and laws, relating to development of, and investment in, infrastructure;

(d) to evaluate proposals for investment in, or enhancements to, nationally significant infrastructure;

(e) to identify any impediments to investment in nationally significant infrastructure and identify strategies to remove any impediments identified;

(f) to promote investment in infrastructure;

(g) to provide advice on infrastructure policy issues arising from climate change;

(h) to review Commonwealth infrastructure funding programs to ensure they align with any Infrastructure Priority Lists;

(i) to undertake or commission research relating to Infrastructure Australia's other functions;

(j) any functions that the Minister, by writing, directs Infrastructure Australia to perform;

(k) any other functions conferred on Infrastructure Australia by this Act or any other law.

In developing infrastructure plans, IA will be required for each proposed priority project to report on:

- anticipated productivity gains
- complementary infrastructure required to maximise productivity gains.

It is intended that IA will be required to undertake an evidence-based audit of Australia's infrastructure base in collaboration with the states, to be revised every five years. Another intention is that it will be required to develop a 15-year pipeline of major infrastructure projects, to be revised every five years based on national, state and local priorities. An independent and capable IA would provide a much-needed foil to the temptation for short-term and politically expedient project selection. As such, it could be an integral component of an overall reform agenda for public infrastructure. The Commission will frame its views with respect to IA once it has determined its final preferred reform package.

Notwithstanding the current and foreshadowed role of IA, and also of state and territory agencies such as Infrastructure NSW, the output of such bodies is advisory only. Ultimately, it is the quality of the actual decisions taken by the relevant Minister and cabinet, and by responsible agencies, that is important, at all levels of government.

Issues raised by participants

Inquiry participants have raised a number of issues relating to governance and institutional arrangements. Some consistent themes are:

- deficiencies in project governance leading to inefficient delivery of public infrastructure
- governments' bias towards large projects
- lack of capabilities in public sector agencies to undertake risk allocation and contract management
- deficiencies in planning and coordination, including corridor preservation
- the need for a project pipeline.

Deficiencies in project governance

Several participants have suggested that governance arrangements may have contributed to the failure of infrastructure projects or 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)

Some participants have suggested there is a need to establish independent agencies to provide advice on infrastructure planning and priorities (Business SA, sub. 31; CCF, sub. 34; Engineers Australia, sub. 26).

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 would yield higher net benefits to the community. It can come at the expense also of small-scale projects that address particular bottlenecks and can help improve the efficiency of the 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)

A related issue is whether project selection processes under current Australian Government funding programs unfairly disadvantage local governments. The roles of local government in delivering public infrastructure differ across Australia, depending on the responsibilities of the individual local government authority. Some larger councils, such as the Brisbane City Council are directly responsible for identifying and prioritising major infrastructure. However, their projects may be rated by the Australian Government as a lower priority than those proposed by State and Territory Governments. 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)

Capabilities of the public sector

A number of participants have suggested that there is a relative lack of capacity of public sector agencies to undertake analysis of risk allocation and management of complex contracts and procurement (chapter 3) and that this has worsened over recent years. Evidence on the skills of public sector clients to manage contracts for major infrastructure projects and the impacts of this on delivery performance in terms of cost and time overruns is discussed in chapter 11.

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 and pointed to the need to build capabilities to oversee the use of funding and finance 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) called for the creation of a centre for procurement excellence as a potential solution to the critical shortage of procurement skills in the public sector. Similarly, the International Centre for Complex Project Management (ICCPM, 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.

The Commission has proposed a package of reforms intended to improve project selection and delivery of public infrastructure services. This includes a proposal (discussed later) for Australian Government funding for public infrastructure to be conditional on State and Territory Governments adopting good practice governance principles and policy processes for public infrastructure projects. It is intended that the package of reforms would go some way towards addressing some of the deficiencies in the capabilities of public sector agencies.

Long-term planning and coordination

A number of participants suggested there is a need to improve long-term planning and coordination of public infrastructure provision across levels of government.

The Business Council of Australia (sub. 39) considered that governments need 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 over direct infrastructure ownership and provision.

Urban Development Institute of Australia (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.

Project pipelines

Many participants have emphasised the need for a long-term 'pipeline' of infrastructure projects to create more opportunities for long-term investors (for example, DIRD, sub. 64; Cbus, sub. 67). The Infrastructure Finance Working Group (2012) considered that the existence of a detailed pipeline of infrastructure projects reflecting the forward intentions of governments would provide potential investors with greater certainty and assist stakeholders in making forward planning commitments.

Participants have suggested that one of the main benefits of a project pipeline is its potential to reduce 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. Better management and coordination of projects has been recommended by several stakeholders to facilitate better planning of workforce demand and improve incentives for training (chapter 13).

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)

Similarly, 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)

The Australian Government has sought to develop an infrastructure pipeline through the establishment of the National Infrastructure Construction Schedule (NICS). This is a collaborative effort between the Australian, State 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 2014b).

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) claimed 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.

The commitment of funds to projects identified on the NICS is announced by a funding envelope prior to tender. This effectively means that the government is revealing its willingness to pay. This raises the likelihood that such information might reduce the value for money received by the government for procurement contracts. Prior to going to market, project tender processes should be designed to encourage contestability for private provision.

The Commission has proposed in this chapter (section 7.5) a mechanism to strengthen criteria for assessment of public infrastructure funded by the Australian Government. The adoption of the overall package of reforms advocated in this report should naturally lead to the disclosure of public information sufficient for providers to have a reasonable indication of the general nature of future public infrastructure, which would constitute an effective 'pipeline'. The current arrangements under the NICS would also continue.

INFORMATION REQUEST 7.1

The Commission's current inclination is that the package of measures proposed in this report would be sufficient to constitute a 'pipeline' that would assist purchasers and tenderers in forward planning and to minimise costs. The Commission seeks views on the appropriate organisational framework to collect and disseminate information about a pipeline of projects and the extent to which private organisations should provide information about their plans to build significant infrastructure.

Corridor preservation

Some stakeholders commented on the importance of preserving land corridors given the expectation of projected demographic change and increased demand for infrastructure (DIRD, sub. 64; Office of the Infrastructure Coordinator, sub. 78; Smart Infrastructure Facility, sub. 94).

Delays in identifying and acquiring land to be set aside for future corridors has the potential to significantly increase the costs of the development and ongoing operation of transport infrastructure, which may distort project selection decisions. Failure to protect corridors can result in development encroaching on preferred routes, sub-optimal routes or expensive alternatives (such as tunnels) (SCOTI 2012b).

The Urban Development Institute of Australia (sub. 40) commented that in some cases the cost to acquire the necessary corridors for new infrastructure is so high that techniques such as extensive underground tunnelling must be employed, often at very high cost. The Office of the Infrastructure Coordinator (sub. 78) suggested that the cost of developing infrastructure corridors using tunnels can be 8–10 times more expensive than broadly comparable surface alternatives. The purchase costs of land have also been identified by others as a significant driver of infrastructure construction costs (chapter 8).

The costs of acquiring land for corridor preservation are also influenced by the legislative requirements for compensation of land holders, which vary across jurisdictions. However, land preservation issues are broader than simply the cost of reserving or acquiring land. Corridor preservation can be impeded, or the net benefits reduced, by developments on land adjacent to corridors. State governments often have a 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 Commonwealth for the building of the Badgery's Creek airport, protected by a 'buffer zone' (Parliament of New South Wales 2006).

The Office of the Infrastructure Coordinator (sub. 78) commented that delays in acquiring land could substantially increase the cost of future projects and impact on the ability to respond to infrastructure demand. It 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 and agree to a national regime as part of infrastructure planning.

Smart Infrastructure Facility (sub. 94) also supported a national approach to land preservation through the establishment of a national land bank to fund the acquisition of corridors based on land use and demographic outlooks for the next 50 and 100 years.

The need to improve land planning and corridor preservation was identified in both the National Land Freight Strategy and National Ports Strategy. However, there appears to be no formal agreement between jurisdictions. A critical part of any national regime would need to include an intergovernmental planning process and agreement on commitment of funds for corridor protection.

Moreover, there appears to be no consistent strategy for the use of reserved land prior to its use for public infrastructure. With some corridor reservations potentially lasting decades, the credible allocation of reserves for alternate uses prior to the development of infrastructure could 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.

INFORMATION REQUEST 7.2

The Commission seeks further information from participants on the costs and benefits of land corridor and site preservation strategies. In particular, it seeks evidence on the effectiveness of current jurisdictional strategies and the merits of a national regime. It also seeks views on the optimal ways in which corridors and sites can be used prior to infrastructure developments.

7.4 Options for improving governance and institutional arrangements in the roads sector

The Commission has considered institutional and governance reform of the arrangements for road provision. Expenditure on roads is a dominant part of government infrastructure provision. Indeed, it is likely to be the single largest expenditure item under control of the three levels of government. Yet it has a very weak pricing structure. In effect, consumer involvement in the provision of roads is minimal, and instead government agencies and arbitrary Ministerial decision-making determine supply, with taxes (for example, fuel excise) and charges (registration) making up the bulk of funding sources. Recent toll road experience has shown the importance of knowledge of consumer willingness to pay to guide the expenditure of funds on road provision.

By way of comparison, rail infrastructure services are also substantially under the control of governments. However, unlike roads, the prospects — other than in interstate freight, via the Australian Rail Track Corporation — for the pricing of rail infrastructure to create a direct link between consumer willingness to pay and project selection are very limited. The existing pricing policy for urban rail (that is, fares) provides only a low level of cost recovery, such that the prospect of it equating to a level that could directly influence rail investment is minimal.

On the other hand, road consumers generally pay, with total revenue collected by road-related taxes roughly equal to total expenditure on roads. However, there is no direct link from road-related revenue to road-related provision and expenditure. Over the medium term there is a good prospect for reform of road pricing, based on in-vehicle technology and improvements to institutional structures, to link more directly the provision of roads with consumer judgment and willingness to pay. Such arrangements would constitute an important institutional mechanism to adopt the project and process reforms at the heart of this inquiry.

Improved outcomes in the tasks of road provision and funding (box 7.3) 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. Such arrangements could also facilitate community acceptance of further adoption of road user charging.

Box 7.3 **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 effective use of the infrastructure

The way in which these tasks are undertaken can differ considerably, depending on:

- who is responsible for undertaking the task
- accountability for outcomes achieved
- how performance is monitored.

Source: PC (2006).

Although the institutional models discussed below involve government (or a government entity) as the central decision maker, there is a strong role and opportunity for private sector involvement in the design, build, operation and financing of road infrastructure. Chapters 3 and 11 discuss the various models of private sector involvement in infrastructure delivery, such as traditional design and construct models and PPPs.

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 and the OECD (2013b) has recently suggested that a regulated asset base approach could be used in the roads sector.

Some inquiry participants also pointed to the potential to use alternative institutional arrangements for the roads sector. For example, Smart Infrastructure Facility (sub. 94) noted that many assets, including roads, have no clear asset owner and are not carried on balance sheet like private assets. They suggested that 'the adoption of a corporatised framework to manage public assets has the potential to yield major governance improvements and promote better allocative decision making' (p. 9).

Similarly, Ergas (sub. 87) suggested that road agencies should be corporatised on a commercial basis.

The Commission has also previously identified a number of institutional models that could help achieve a more commercial focus to road provision and management and improve investment outcomes by making expenditure decisions more responsive to the needs of road users (PC 2006).

As noted in chapter 4, there are current efforts in Australia as part of the HVCI reform to introduce a more market-oriented framework to charging and road provision. While the reforms have so far focused on improving the provision of road infrastructure for heavy vehicles, they serve as a useful demonstration of the approach used. Similar models have potential application to road networks more broadly, including urban roads and those parts of road networks predominately used by cars and other light vehicles.

There are four broad institutional models that are currently used, or have the potential to be used, in the roads sector.

- *Departmental model* — a departmental model of road provision, with earmarking of road-related taxes and charges aimed at fully funding roads
- *Road fund model* — project selection, management and allocation of road funding based on a more 'commercial' approach at arm's length from government
- *Regulated public road agency model* — public road authorities are run on a more commercial 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.

Variations and hybrids of these models are also possible. 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. Once decisions about project selection have been made, delivery of approved projects is the responsibility

of road agencies, which are primarily funded from consolidated revenue appropriated through the annual budget process, with some hypothecation.

Thus, rather than operating like a commercial entity, road authorities are essentially managed and funded as government departments with performance monitoring largely based on the time and cost of delivering approved road projects. 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 and at each annual budget. This may mean that road funding bears little direct relationship to users' needs or willingness to pay, particularly for infrastructure with long asset lives. This can contribute to funding and investment uncertainty for road agencies and limit their ability to design and manage long-term road investment programs and improve utilisation of existing infrastructure networks.

A possible feature of the departmental model of road provision that can reduce uncertainty about the availability of funding is hypothecation of revenue collected from tax bases, including fuel taxes and vehicle registration charges, and direct road user charges if these are levied. This requires revenue to be legislatively earmarked or effectively committed to partially or fully fund road expenditure and investment.

However, the benefits of earmarking road-related tax revenues and charges may have a limited effect on efficient road expenditure and decision making where taxes only cover a portion of road expenditure, where revenues are diverted by government for use for other purposes, or where road funding is derived from non-road related revenue sources. This is because road spending bears little relationship to the road taxes or charges levied.

Further, the benefits of hypothecation depend on the institutional arrangements and decision-making processes that support them. As noted earlier and in previous chapters, decisions about public road infrastructure can be highly politicised. There is also a disconnect between the mechanisms that governments use to collect revenues from motorists and the road services that governments provide. Current road–related taxes and charges do not provide a signal to use and provide roads in a way that meets the needs and expectations of the community.

Road fund model

The road fund model is distinct from the departmental approach in that it includes institutional arrangements that involve devolution of responsibility and decision-making for road provision to a separate entity tasked with managing the funding of road infrastructure.

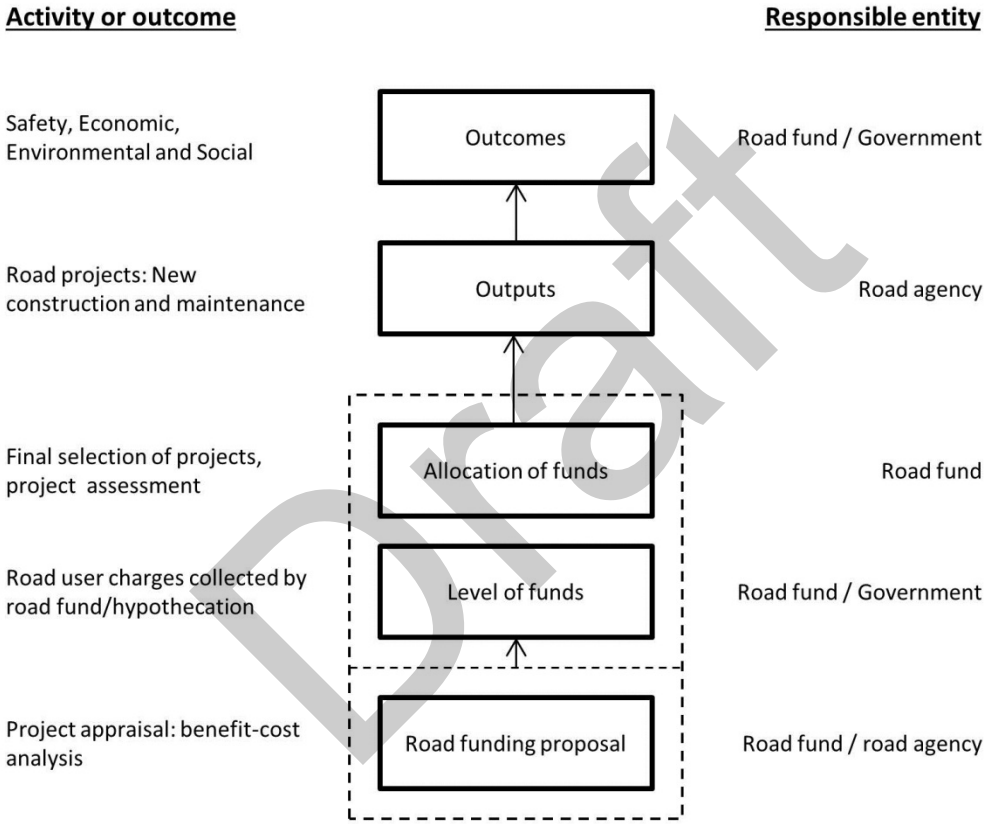
The key features of this approach include:

- Revenue from road-related sources (including direct user charges where these are used (discussed in chapter 4) and other road-related taxes and charges) are allocated to a separate dedicated fund, rather than to consolidated revenue (revenue could be hypothecated or collected directly by the road fund entity). The amount of revenue would not be locked in and should vary over time (via changes to tax rates and user charges) to meet the requirements of the road program. The road program would be determined taking into account the government's equity obligations and selection of road projects yielding the highest net benefits to the community. This is designed to prevent road providers' revenue sources from being seen as a 'honey pot'.
- An organisational structure will operate at arm's length from government with a chosen entity (the road fund) responsible for overseeing the fund. The organisational structure could take a number of forms. For example, it could involve:
  - an independent board comprised of members that represent an appropriate balance of interests, including those of road users, and a number of independent directors. Board members would be appointed on merit following a consultative, transparent and independent selection process that is undertaken at arm's length from the relevant Minister
  - an advisory or consultative panel (that is also comprised of members representing an appropriate balance of interests), which would include a transparent consultation process involving road users, and which would make recommendations on road projects to the relevant Minister. (As discussed later, an effective consumer consultation process should be a feature of any institutional model adopted in the roads sector).
- Road funds would be allocated to road infrastructure projects (including upgrade and maintenance of existing roads) according to assessment criteria that seek to provide the highest net benefits to the community from road infrastructure projects. There would also be disclosure of the analysis used to select the road program.

This approach essentially separates the task of road funder and road provider (figure 7.1). The road fund would not undertake detailed investment appraisal or delivery of road projects. These tasks could be the responsibility of road agencies and local governments, who would submit funding proposals (supported by cost-benefit analysis) to the road fund. The road fund would have the autonomy to select projects that provide the highest net benefits to the community. 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. It may also be necessary for the government to provide the road fund with additional revenue sources (or guarantees) to support any long term contractual arrangement with the private sector (for example, payments to a road operator for the construction and operation of a major road through a PPP) (chapters 3 and 6).

Figure 7.1 **Road fund model institutional arrangements**



Source: Adapted from PC (2006).

Further, local governments could choose to use a regional version of this approach to deliver infrastructure and may submit funding proposals for a cluster of road-related projects. Some local councils already undertake joint activities. 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, 2013a).

Box 7.4 New Zealand road funding arrangements

Prior to 2008, Land Transport New Zealand (LTNZ) 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 Programme and approving funds and procurement for land transport activities. The principal road provider, Transit New Zealand, was the Crown 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

A 2007 review by the New Zealand State Services Commission identified a number of issues relating to governance and funding arrangements in the land transport sector. This included expenditure pressures not being addressed strategically, a lack of clarity around the roles of some government agencies and duplication of functions, inconsistent planning and funding policies distorting incentives in the sector, and limited collaboration to align central, regional and local land transport plans. The review recommended that LTNZ should be merged with Transit NZ as:

- the benefits of integration would outweigh those of retaining separate entities
- one Crown entity would be required to consider all transport modes and activities and ensure that appropriate trade-offs are made
- one Crown entity would be accountable to the Minister
- one Crown entity would be required to focus on cost-effective delivery.

Consequently, the two former entities were merged in July 2008 to form the New Zealand Transport Agency (NZTA). The statutory functions of the NZTA under the *Land Transport Management Act 2003* (NZ) (as amended in 2008) 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 the 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), vehicle registration and licensing fees. As a Crown agency, the 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 the issuance of a statement of service performance and a requirement to produce an annual report.

Sources: NZ Government (2007, 2012).

An alternative road fund arrangement could involve one entity that is responsible for both the task of road funder and road provider. An example of this is the approach currently in operation in New Zealand (box 7.4).

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, planning and distorted incentives arising from the separation of funder and provider.

Government would continue to play an essential role under a road fund approach by setting the strategic focus, key decision-making parameters and specific outputs and outcomes it requires from the road fund. Depending on the organisational structure adopted for the road fund, these arrangements and parameters could be specified in legislation, statements of intent, or performance agreements. Consequently, the road fund would be directly accountable to the government for meeting these outcomes with performance potentially monitored through annual disclosure and reporting requirements. Government would retain the discretion to override the decisions of the road fund but were it to do so it should be through an open and transparent process, for example, a written directive to the road fund.

Advantages and limitations of the road fund model

There are some important advantages of the road fund model. First, it facilitates greater financial and decision-making independence from government's annual budget process. If the road fund is fully funded by road users this can also provide an opportunity to better link road user charges, revenues, expenditure and investment. This could be expected to provide greater investment certainty and improve planning and decision making, particularly if the fund is able to control road revenues (and influence the level of user charges and taxes) and borrow to finance economically justified road projects.

Second, there is improved transparency and accountability arising from the separation of control over funding from implementation responsibilities, and also greater use of road user charges in place of general taxes. Road funding priorities, trade-offs and project allocations are subject to wider scrutiny, which can strengthen the financial discipline on investment and expenditure decisions. Greater visibility of the amount spent on roads and the level of services provided may also help to improve community acceptability of road charging arrangements.

There are also potential limitations of the road fund model which may reduce the effectiveness of such an approach in improving the efficiency of road investment decisions and capacity to improve operation efficiency of existing road networks. The road fund approach is essentially a strengthened form of hypothecation. Consequently, similar limitations that apply to the departmental procurement approach can also apply to the road fund model. In particular, where the revenues are redirected for other uses, and where revenues received by the road fund bear little relationship to the road taxes or charges levied, then it is more likely that over or underinvestment in the road network may occur. Even where revenues are derived from direct road user pricing, inefficiencies could arise if the level of the charges is incorrectly determined. One way to address this issue is to provide the road fund with authority to set road user charges or to recommend the level of road charges that should apply to the government.

Potential implementation issues

Implementation of the road fund approach could be adopted at either the national level or the state and territory level. The adoption of a single *national* road fund for heavy vehicles would be consistent with existing network-wide charges. However, roads are provided jointly for both heavy and light vehicles. Therefore, the fund's use would need to be either limited to certain roads, or should receive other revenues, such as from petrol excise, to ensure sufficient funds are available to the road fund.

The adoption of a national road fund raises inter-jurisdictional issues related to the sources of road funding, 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 and across state and territory road agencies. Importantly, if all revenues are allocated to a national fund for all roads, a national road funding program would be necessary. The program would need to detail agreed cost-sharing arrangements with state and local governments and the procedures under which they manage their respective road funding shares.

Two main approaches could be used to allocate funds from road-related revenue and charges:

- a formula–based method that allocates funds based on the characteristics of roads and traffic, for example, population, road length and traffic flow
- cost–benefit analysis to evaluate competing road projects based on their expected net benefits and overall priority as part of the road network.

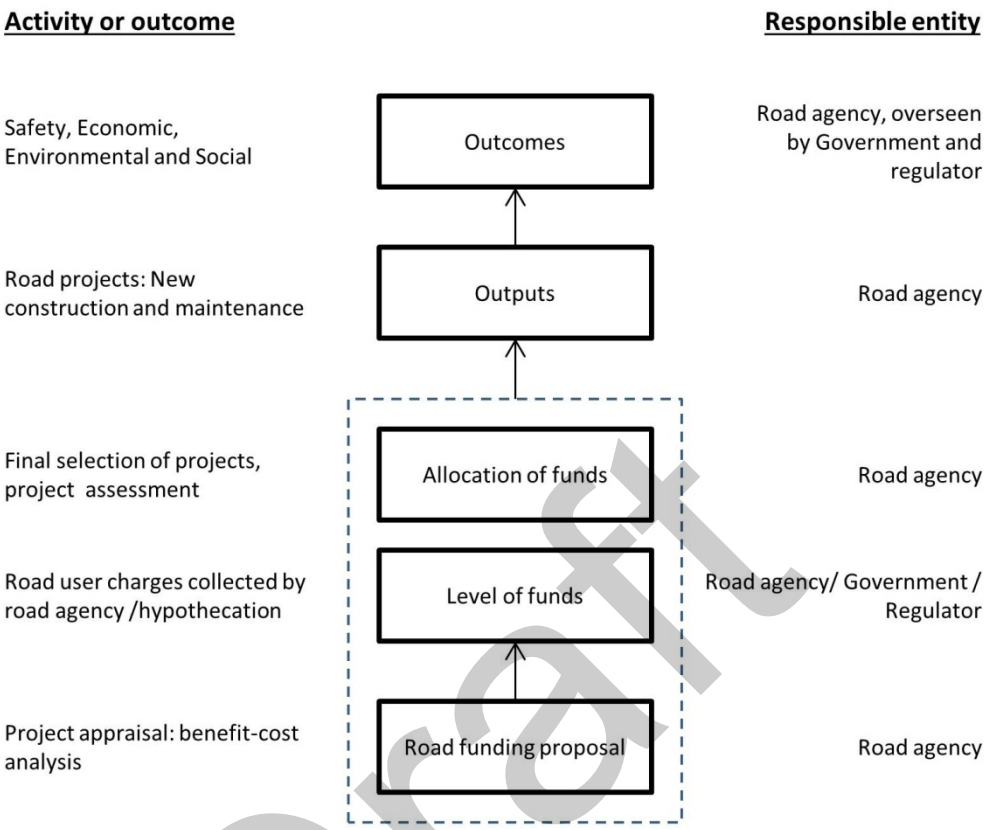
A combination of the above approaches could also be used and may be necessary where reliance on cost–benefit analysis alone does not provide a level of road services sufficient to meet the equity objectives (including community services obligations) of government, for example, in delivering road services to regional areas. The issue of equitable access to the fund by regions is more important if fuel excise is used as the primary revenue source, as this raises the potential for cross subsidisation between road users.

An alternative option is for each jurisdiction to establish a road fund (or refine an existing fund) to deliver and maintain roads for which they are responsible. The Australian Government could also allocate revenue directly to road funds established by State and Territory Governments. Such an approach would appear more consistent with the principle of subsidiarity. However, under current road user charging arrangements, most revenue would continue to accrue to the Australian Government rather than the states and territories and hence there would still need to be a method for allocation of funds to address the jurisdictional imbalance between charges and expenditures incurred. Moreover, there would remain a need to distribute funds to local government providers of roads.

A regulated public road agency model

An alternative to the road fund model is an institutional arrangement that integrates all elements of road funding and provision into a single public road agency that operates on a more commercial basis using both funding from governments and revenue raised from direct charges on road users (figure 7.2).

Figure 7.2 **Regulated public road agency model**



Source: Adapted from PC (2006).

The key features of this approach could involve:

- the creation of one or more road agencies with responsibility for operating the road network (or parts of the network). The agency could own 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 management of new road assets), impose charges for their use, and borrow and invest capital
- an operating structure which may include an independent board of management, a chairperson and a chief executive, with a statement of objectives or corporate intent issued by the government. Again, board members would be appointed based on merit, following a transparent and independent selection process
- road agencies that are required to earn an adequate rate of return on road assets, fund depreciation and maintenance and manage assets on a more commercial basis
- road user charges, road quality standards and required investment outcomes would be overseen by a regulator, for example, using a regulated asset base approach (box 7.5).

Box 7.5 The Regulated Asset Base approach

The regulated asset base (RAB) approach establishes a value for the assets managed by the agency and employs an economic regulator to determine the revenue requirements for maintenance and investment together with the rate of return on investment the agency is allowed to make. Charges for use of the assets are also regulated. Rates of investment, rates of return and prices are reviewed periodically, often on a five-year cycle. Periodic review enables transparent adjustment to external conditions within the constraints of regulatory duties.

Under the RAB, 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 operating expenditure
- the payment of tax or tax equivalents required to comply with competitive neutrality policy.

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 adoption of road user charges and development of shadow tolls.

Source: OECD (2013b).

An important benefit of this approach is that it integrates the road funding, project selection and expenditure tasks. This enables road investment decisions to be considered on a portfolio-wide basis, whereby the road agency is encouraged to consider options and needs across the entire road network (or elements of the network in which it has been given responsibility). In doing so, the agency is encouraged to consider trade-offs between large scale projects (for example construction of a new road) and other potentially less costly and smaller options, including making more efficient use of existing roads (for example, by using advanced traffic management systems).

Further, compared with the traditional departmental approach, the regulated public road agency model (and the road fund if appropriately structured) has the potential to generate larger efficiency benefits by providing incentives to consider road user charges, improve asset utilisation, and apply more rigorous economic assessment of new investments. Much will depend on the final governance arrangements including the degree to which existing cultural standards of institutions remain unchanged by reform. In doing so, the approach provides stronger incentives for the road agency or fund 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 and allocate risks
- be more responsive to customer needs and adopt innovative ways to improve asset utilisation to the benefit of road users.

However, like the road fund model, the regulated road agency approach would rely to some extent on government funding sources, as the substantial public good aspects of road provision and network externalities, and equity objectives of government, makes full reliance on direct road user charging impractical. In the absence of comprehensive direct user charging, the public road agency's revenue requirements for the road network (or sections of the network) could be estimated based on a unit cost per road user ('shadow toll'). Further, as noted above, it may be necessary for the Government to provide the road agency with additional sources of funding (or guarantees) to support any long-term contractual obligations that arise from contracts entered into with the private sector for the construction and operation of new roads. The equity objectives of government, for example, in delivering road services to regional areas, could be achieved through requirements for the public road agency to fulfil community service obligations (CSO), funded by CSO payments.

There are also other potentially significant limitations to this approach. It essentially requires a political decision to remove the road network (or elements of the road network) from the general public budget 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 road network (OECD 2013b). If an existing institution is adapted to this purpose, culture becomes important. That said, the Government plays an essential role in setting the objectives and outcomes that are expected to be achieved by road agencies, with a regulator overseeing road user charges, road quality standards and required investment outcomes. As with the road fund model, government may choose to override decisions of the regulator and the regulated road agency. However, such intervention would be more transparent and all parties would be made accountable for their decisions.

As with the road fund model, the regulated public road agency model also raises issues associated with what elements of the road network the public road agency would be responsible for. A range of options is possible, including a single road agency, a number of geographically based road agencies combining national, state and local roads, or separate agencies responsible for major road networks. There is also an option to establish a road agency for local roads owned by a collection of local governments. The relevant State Government could assist in establishing such

an approach through capacity building mechanisms by providing specialist expert and technical assistance. In any case, it may be necessary to establish a public road agency with responsibility for a large part of the road network to achieve economies of scale required to establish a regulator (OECD 2013b).

The Heavy Vehicle Charging and Investment Reform Project

As discussed in chapter 4, the HVCI reform project is currently developing a reform package for heavy vehicle charging that combines elements of the road fund and regulated road agency model (box 7.6). Specifically, an infrastructure coordinator (similar to a road fund) would coordinate expenditure plans, receive revenue from road-related taxes and charges, and allocate funds to road providers. A separate regulator would set user road-related taxes and charges after scrutinising a revenue requirement lodged by the infrastructure coordinator on behalf of road providers.

Box 7.6 Institutional reform under the HVCI reform project

Problems with current arrangements

In response to the 2006 Productivity Commission inquiry into Road and Rail Freight Infrastructure Pricing, COAG set up the COAG Road Reform Plan (CRRP). This was later renamed the HVCI reform project which has been established to design a new charging and investment framework to deliver more efficient charging and infrastructure provision for heavy vehicle services. The main problems with the current system identified by the HVCI project are:

- insufficient linking of revenues received from government and expenditure lead to poor transparency and accountability of road providers for road adequacy
- road providers lack commercial incentive to pursue greater productive efficiency
- investment arrangements are complex with no direct participation from industry
- weak coordination in long-term planning for local, state and national road providers.

Local governments provide a large part of the distribution network for freight (local government roads make up around 80 per cent of the road network) but are currently excluded from receiving revenues directly from heavy vehicle charges. Councils' reliance on grants from the Australian and State Governments effectively provides incentives to prioritise rate payer services rather than heavy vehicle road services.

As a result, a large number of infrastructure bottlenecks are created on the local road network, often referred to as the 'first and last mile' issue.

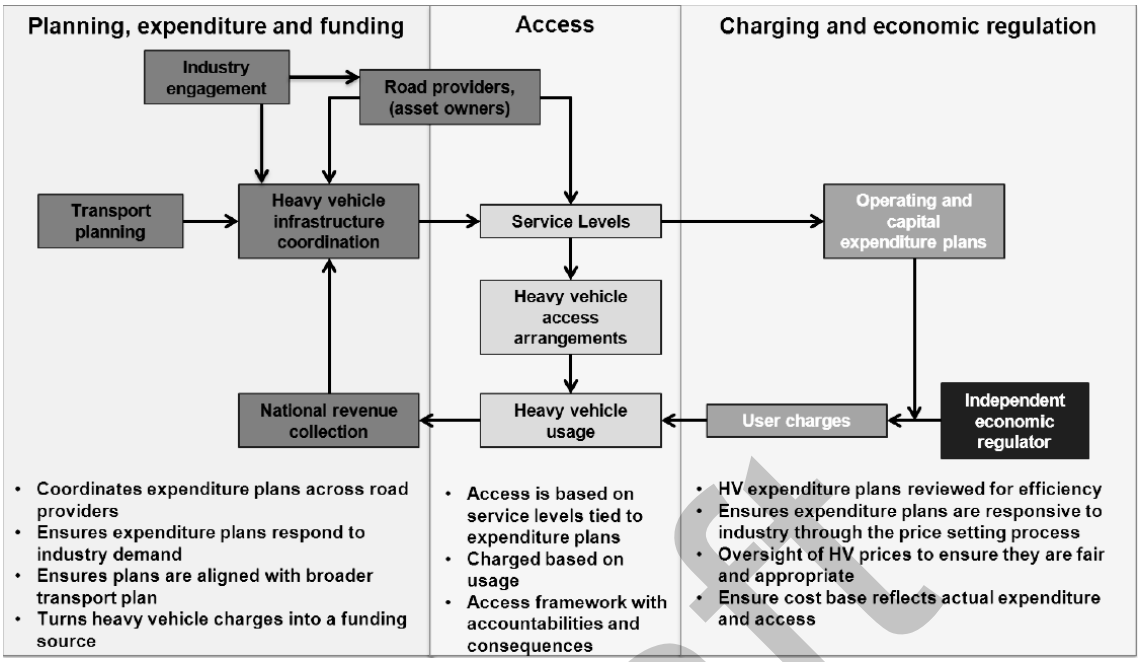
Proposed institutional reforms

The proposed reforms under the HVCI project are intended to ensure charges are more cost-reflective and flow back to road providers as a source of funding for provision and maintenance. The specific governance arrangements are still to be determined. The diagram below summarises the system envisaged by the HVCI. The key elements of the proposed institutional reforms include:

- 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.
- the heavy vehicle road infrastructure coordinator will work with industry and state road providers and local government to develop the heavy vehicle road expenditure plan. This will be reviewed by the independent economic regulator who will subject plans to industry consultation. To overcome the lack of coordination between levels of government, each jurisdiction could have a road infrastructure coordinator responsible for creating the state and territory expenditure plans with local government and state road providers that would align with broader transport plans.
- revenue flows back to road providers to fund approved expenditure plans. An independent regulator will approve efficient charges based on funding requirements for the approved heavy vehicle road plans.

(Continued next page)

Box 7.6 (continued)



HVCI anticipates that this will provide greater revenue certainty for road providers, which would support better 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 will be encouraged to develop regional local government groups.

Sources: HVCI (sub. 77); (2013); PC (2006).

The Commission supports the objectives of the proposed HVCI reforms and emphasises the importance of good governance principles in the design of the institutional arrangements. Institutional and governance arrangements should be designed to facilitate and encourage, to the fullest extent possible, adoption of more effective pricing options which involve greater use of direct user charging.

Private provision of roads

The private sector can, and already does, provide different aspects of road management and provision for various elements of the road network. Private involvement in the management and provision of roads ranges from the private sector contracting to provide specific services (such as design, build, operate, maintain) for publicly-owned roads to private financing and ownership of particular roads.

Examples of privately provided and operated roads in Australia include CityLink in Melbourne, where a private operator has been granted an exclusive licence to design, build, finance, operate, levy tolls and maintain the road until 2034. Another example is the proposed WestConnex project in New South Wales, which includes a combination of capacity improvements on existing roads and new sections of motorway. Although the tender process for this project has not yet concluded, the intention is for the NSW Government to contract with the private sector for the design, construction, maintenance and operation of the road and to transfer demand risk for the road following establishment of patronage levels (appendix B).

Private ownership and provision of roads on a *network-wide* basis is limited by concerns about monopoly power, high transaction costs relating to access, interconnection issues for the multiple users of the road network and the need to effectively deal with community access and public interest issues. At the same time, the public good characteristics of large parts of the road network make it neither feasible nor desirable to provide all roads privately (PC 2006).

Which institutional model can most effectively facilitate pricing reform?

Institutional reform in the roads sector would help to achieve better outcomes for the community in the provision and delivery of roads. Deciding on the most appropriate model and implementing reform is far from straightforward and is likely to involve significant complexities and challenges. Not least of all is achieving community acceptance for the adoption of new road user charging schemes. Any of the above institutional models should include a consultation mechanism which provides an open and transparent process for road users and other groups to identify and contribute to the implementation of a system of user charging. Indeed, the HVCI reform includes a process of industry engagement, which involves road expenditure plans being developed with industry and the HVCI board comprising representation from the freight industry (chapter 4).

The Automobile Association of Australia (sub. 65) 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.

A range of consumer and stakeholder engagement approaches have been used across public infrastructure sectors (box 7.7). These approaches differ in terms of the role of consumers in the decision-making process.

Effective industry consultation mechanisms could provide a means to not only explore the potential for more effective pricing options, but also to gain wider acceptance of pricing mechanisms by providing greater understanding of the potential benefits. There would be merit in considering the adoption of more formal industry engagement in the road sector. The draft proposal outlined in chapter 4 for State and Territory Governments to undertake pilot studies of distance and location charging for cars and other light vehicles is a first step to achieving wider reforms. These pilots would provide valuable information on both the economic and social implications of adopting road user charging in Australia.

Current efforts by the HVCI reform project to achieve more cost-reflective charging and improved expenditure decisions in the heavy vehicle road sector are also a good start to achieving better outcomes for the community. However, as noted in chapter 4, there are numerous issues still to be worked through before this reform is complete.

For road networks that are predominately used by cars and other light vehicles, the adoption of a road fund model with hypothecation of road-related taxes and user charges (including any revenue collected from direct user charging) could help to facilitate more transparency in the revenues collected and the expenditure of those funds on road projects. This could also start a process of transition to a more commercial approach to road funding and provision over time, such as a form of the regulated public road agency model outlined in this chapter. Any reforms for cars and other light vehicles should be considered alongside the reforms being developed as part of the current HVCI reform project.

As is evident by the HVCI reform efforts, comprehensive reform in the roads sector is likely to be a long journey requiring significant commitment and effort from all levels of government in Australia.

Box 7.7 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 aimed at achieving greater accountability in decision-making by public and private sector bodies. Engagement can take a number of forms.

- *Public consultation* — by inviting anyone to respond to proposals or consultation papers, or attend public consultation events.
- *Targeted consultation* — through consumer surveys, focus groups and consumer panels, or seeking one-off consultations with consumer representative groups.
- *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 UK.
- *Negotiated settlements (forms of constructive engagement)* — consumers (or consumers 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 judgements about the outcome. The regulator may potentially also become involved if no agreement could be reached. There are various examples of negotiated settlements between utilities and customers 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 Florida.
- *A formal representative role* — this could include industry representation on a committee or a board. For example, the HVCI reform project is governed through a multi-jurisdictional board which include industry groups with an independent chair.

Sources: Littlechild (2011); Owen (2013); HVCI (sub. 77).

DRAFT RECOMMENDATION 7.2

All governments should take deliberate steps towards implementing institutional reforms in the road sector for cars and other light vehicles that improve project selection processes, facilitate greater adoption of direct user charging mechanisms, and more directly link road charge revenue with future spending on roads. The consideration of institutional reforms for cars and other light vehicles should take into account the current reforms being developed for heavy vehicles under the Heavy Vehicle Charging and Investment reform process.

The Commission considers that a road fund model should form the basis of starting a long-term transition to a more commercial approach to project selection and road provision for cars and other light vehicles. To be effective, the road fund needs to have access to adequate sources of funds, a significant degree of autonomy, and transparent processes for determining the level and allocation of funds.

Institutional and governance arrangements adopted should include a formal procedure for consultation with road users and the broader community, as well as systematic post-project evaluation and periodic review of the arrangements.

7.5 The influence of the Australian Government

As noted in chapter 4, 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. However, as noted in this report, there are instances where full cost recovery through direct user charging may not be feasible, optimal or even cost effective based on current technology. Consequently, a significant proportion of public infrastructure, including roads, will need to be at least partially funded by government. This raises the issue of what revenue source should be used to fund infrastructure. Ideally, 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). However, State and Territory Governments have limited access to broad-based taxes yet they are responsible for the largest proportion of expenditure on public services. 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.

Current arrangements for Australian Government funding

The Australian Government provides funding to Local, State and Territory Governments through a number of arrangements (box 7.8). These arrangements include:

- 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.

The processes and criteria used to allocate infrastructure specific 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. 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 more generally consistent with government policy
- legislated or quantitative 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 7.9).

Some inquiry participants raised issues relating to the way that the Australian Government distributes funding to the states and territories. For instance, 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.

Box 7.8 Australian Government funding to Local, State and Territory Governments

The Intergovernmental Agreement on Federal Financial Relations (IGA) (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) either 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 2013-14, $5 billion of infrastructure related NPPs is to be paid to the states and territories (Australian Government 2013).

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 (CGC 2013).

The Australian Government also provides assistance to local governments through financial assistance grants. 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 (CGC 2012).

Table 7.1 **Examples of infrastructure specific grants**

	Australian Government contribution	*Criteria for allocation of infrastructure grants*
Roads to recovery Program	$1.75 billion (2014-15 to 2018-19)	Eligible local roads must appear on the National Building Program Roads to Recovery list
National Smart Managed Motorways Program	Project specific	Projects have a high benefit–cost ratio and the relevant State Government has signed National Partnership Agreements on the establishment of National Jurisdictions for heavy vehicles, interstate rail operations and maritime regulation
Community Development Grants Program	$342 million (2013-14 to 2016-17)	Projects assessed against three criteria: outcome; viability and sustainability; and the financial viability of the funding proponent
Black Spot Program	$300 million (2014-15 to 2018-19)	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 Program	Project specific	To be eligible for funds, projects must satisfy a number of criteria established through legislation
One-off grants made 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

Sources: Australian Government (2011); DIRD (2009); DIRD (nd); PC (2011a); SCFFR (2011).

More broadly, the Victorian Government (sub. 81) 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' (p. 9). 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 7.9 **The Building Australia Fund**

The Building Australia Fund 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 fund 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. As at 31 December 2013, the value of the Building Australia Fund stood at $4.8 billion (Australian Government 2014a).

Funding applications (except those relating to eligible National Broadband Network matters) are assessed by Infrastructure Australia which advises the relevant portfolio Minister if the project meets the evaluation criteria. The evaluation criteria are set out in a legislative instrument formulated under the *Nation-building Funds Act 2008* (Cwlth) and are as follows:

- 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 projects risks have been analysed.

The portfolio Minister then prioritises the list of eligible projects and presents it to the Government for consideration. The majority of these projects 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 (Department of Finance 2014).

Examples of projects funded under the program include the construction of the Hunter Expressway in New South Wales ($1.45 billion), an upgrade to the Ipswich Motorway in Brisbane ($884 million), preconstruction, planning, design and engineering works for the Melbourne Metro 1 project ($40 million) (DIRD 2014).

A national infrastructure fund

A number of inquiry participants proposed the establishment of a national infrastructure fund to support investment in public infrastructure projects. As part of the National Infrastructure Plan (2013a), IA proposed consolidation of Australian Government funding sources as well as assessment and prioritisation processes within a single national fund. This approach was supported by some inquiry participants (Australian Contractors Association, sub. 72; Regional Australia Institute, sub. 92). The Victorian Government (sub. 81) also suggested that the

Commission investigate the potential application of a sovereign infrastructure fund, pointing to the P3 Canada Fund as an example (box 7.10). The fund would comprise:

- a fixed annual component
- a supplementary component based on the Australian Government's annual budget capacity.

Box 7.10 **P3 Canada Fund**

The P3 Canada Fund was established in 2009 (administered by a national body, PPP Canada) as a Federal Crown Corporation to encourage and improve project delivery by providing funding support to public infrastructure projects in fifteen 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 amount of the funding support, in combination with any other direct federal assistance, may not exceed 25 per cent of the project's direct construction costs. The level, form and conditions of any funding support will vary depending on the needs of a given project. The Fund allows PPP Canada to step in at the early stages of infrastructure development to assess projects for their PPP viability and to assist clients in the development of PPP procurement strategies. As at December 2013, the Fund had committed over $700 million to over 15 PPP projects in Canada.

Sources: PPP Canada (2014); Victorian Government (sub. 81).

Another approach, suggested by Herbert Smith and Freehills (sub. 68), is the creation of infrastructure funds at the state level. It suggested that a state could establish a state-owned entity under its own legislation with an independent governing body to oversee the operation of the fund. The fund would focus on providing credit enhancement for debt instruments issued for major infrastructure projects.

At this stage, the Commission is not convinced of the desirability of a national infrastructure fund. The creation of a national fund would face many of the same types of 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 that would not provide the highest net benefits to the community. Project proponents would also have incentives to design projects to specifically meet eligibility criteria leading to a situation where the projects selected might not be those that offer the highest net benefits to the community from the entire portfolio of potential infrastructure projects.

To avoid such outcomes, there would need to be effective governance arrangements in place to manage the fund. The Commission considers that, should the Australian Government implement such a fund, the administration of the fund should be subject to the good governance principles and processes discussed earlier (draft recommendation 7.1). Further, if a fund is established, the Government should avoid nominating the size of an infrastructure fund, for the same reasons outlined above for the road funding model. While funds would obviously need to be accounted for in the budget, they could be assigned as contingency and drawn upon as deemed prudent. The Commission will continue to review the evidence on such funds and outline its views in the Final Report.

How do intergovernmental transfers influence the provision, funding and financing of infrastructure?

Intergovernmental transfers may improve community welfare where they generate spillovers across jurisdictions or address vertical fiscal imbalance for State or Local Governments that have inadequate capacity to raise revenue from efficient sources to fund their infrastructure service requirements.

However, funding from higher level government grants can potentially distort incentives for efficiency. For instance, where grants cover a large share of the costs of infrastructure this could reduce incentives for State or Local Governments to use efficient pricing policies. Another example is the infrastructure funding arrangements in place under the National Disaster Relief and Recovery Arrangements (NDRRA). The Commission has previously noted that the NDRRA could distort the incentives of State and Territory Governments to reduce climate-related risks to public infrastructure through disaster mitigation measures (a form of moral hazard). This is because the states and territories do not bear the full cost of rebuilding infrastructure after a disaster (PC 2013a). These issues are likely to be considered in a separate Commission inquiry into national disaster funding arrangements recently foreshadowed by the Australian Treasurer and Minister for Justice (Hockey and Keenan 2013; Attorney-General's Department, sub. 101).

Further, if the Australian Government's priorities for infrastructure do not reflect the best use of funds by the states and local governments this could result in investments that do not provide the highest net benefits to the community from the portfolio of potential infrastructure projects. In this context, the Commission recently noted in its inquiry into Tasmanian Shipping and Freight that the current funding model for roads can lead to a less than efficient allocation of investment with funding not always directed to projects that deliver the greatest net benefits. It also noted that the Australian Government should ensure that the funding it provides for Tasmanian transport infrastructure is consistent with the goals and objectives of a freight strategy (PC 2014c).

A potential mechanism to impose greater discipline on provision, funding and financing of public infrastructure

There may be scope for the Australian Government to use its influence and role in funding public infrastructure to further strengthen the incentives for improved outcomes for the community in the delivery of public infrastructure. Indeed, some participants 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.

One option that could be used to strengthen incentives for State and Territory Governments to select and deliver infrastructure services more efficiently is to make Australian Government funding conditional on adherence to a set of good practice governance principles and policy processes. These could also apply to the establishment of a national infrastructure fund (were the Australian Government to consider such a fund) and other forms of assistance, such as loans and guarantees (chapter 6). The principles and policy processes would be those deemed necessary for improvements in the selection, assessment and implementation of public infrastructure projects, and could be based on those set out in draft recommendation 7.1.

The purpose of such an approach would be to facilitate better processes, decisions and ultimately outcomes for the provision and delivery of public infrastructure. This approach is superior to the Australian Government prescribing which projects

should be undertaken by Local, and State or Territory Governments. The relevant Australian Government Minister would be responsible for approving and issuing the criteria, which could be set out in a ministerial direction. The Minister may also choose to sanction existing standards or guidelines established by State and Territory Governments, for example, relating to major project procurement and risk assessment. Consultation on the criteria that are to apply to the provision of Australian Government funding for infrastructure could be undertaken with local government and the states and territories.

Responsibility for ensuring that public infrastructure projects comply with the proposed principles and processes could be vested in the Department of Infrastructure and Regional Development or Infrastructure Australia.

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 and be disclosed in a separate infrastructure budget paper. A list of infrastructure projects which qualify under this process could also be made publicly available and regularly updated.

The Commission acknowledges that there may be some implementation issues associated with the development of such an approach, particularly given the variety of infrastructure grant programs that currently exist and the criteria and eligibility arrangements already in place for some specific programs. Further, it may be difficult for some individual local governments to comply with any conditions imposed, particularly where they require specialist and technical expertise in the preparation of project appraisals. Therefore, care should be taken to ensure that any obligations placed on local governments are proportionate to both the funds the Australian Government provides and the capacity of individual local governments to comply.

It is essential that the governance reforms apply to all institutions responsible for public infrastructure funding. Unless comprehensive reform of governance arrangements is implemented, any increase in funding is likely to increase the costs associated with poor project selection and delivery in line with the increased spending.

DRAFT RECOMMENDATION 7.3

Australian Government funding or other forms of assistance (such as loans and government guarantees) for public infrastructure that is provided to local, State and Territory Governments should be conditional on the following:

- ***use of effective cost–benefit analysis and transparency of assessments including the methodology and assumptions***

- ***evidence of a demonstrable net public benefit from the project which is not obtainable without Australian Government support***
- ***evidence that competitive processes will be used for the selection of financing, design, construction, maintenance and operation of public infrastructure services where these tasks have been outsourced to the private sector***
- ***evidence that the relevant government has efficiently used opportunities for users and other beneficiaries to fund the infrastructure through measures such as user charges, betterment levies and property development charges***
- ***ex post evaluation and publication of public infrastructure project outcomes.***

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

All governments should be encouraged to apply the above principles and actions to their own-funded projects.

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.

Importantly, in the Commission's view the packages of reforms should also naturally lead to the disclosure of public information sufficient for providers to have a reasonable indication of the general nature of future public infrastructure, which would constitute an effective 'pipeline'. It is essential that reform does not start (nor finish) with the creation of another list or pipeline.

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