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CONTENTS

	Page
Abbreviations	vii
OVERVIEW	ix
1 AUSTRALIA'S RECENT EXPERIENCE	1
1.1 Build, own, operate and transfer schemes for urban roads	1
1.2 BOOT schemes for urban roads in Australia	3
1.3 Incentives for BOOT schemes	4
1.4 Financial arrangements	6
1.5 Previous studies	7
1.6 Objectives of the study	8
2 FINANCING URBAN ROADS	11
2.1 Public funding of major urban road projects	11
2.2 Private road financing	16
2.3 Conclusion	28
3 ASSESSMENT OF BOOT SCHEMES	31
3.1 Assessment of BOOT schemes by project stage	31
3.2 Equity considerations	41
3.3 Conclusion	42
4 ASSESSMENT AGAINST GOVERNMENT OBJECTIVES	43
4.1 Government guidelines	43
4.2 Assessment	45
4.3 Conclusion	56
APPENDICES	
A Australian urban road BOOT schemes	59
B Meeting and visits	75
GLOSSARY	77
REFERENCES	81

ABBREVIATIONS

AAA	Australian Automobile Association
ACA	Australian Constructors Association
BIE	Bureau of Industry Economics
BOO	Build Own Operate
BOOT	Build Own Operate Transfer
BTCE	Bureau of Transport and Communications Economics
BTO	Build Transfer Operate
CCF	Civil Contractor Federation
COAG	Council of Australian Governments
CSOs	Community Service Obligations
CTC	Competitive Tendering and Contracting
DAA	Development Allowance Authority
DIPs	Deferred income projects
EPAC	Economic Planning Advisory Commission
GBEs	Government Business Enterprises
IRGs	Identified Road Grants
ITSA	Intelligent Transport Systems Australia
LCA	Loan Council Allocation
MAE	Material Adverse Effects
NHS	National Highway System
NPV	Net present value
NSW	New South Wales
SHT	Sydney Harbour Tunnel
SWR	State Wide Roads Limited
RTA	Road and Traffic Authority

Key points

- Current road funding approaches do not readily facilitate large scale investment projects such as those that have been financed through BOOT schemes.
- Recently, traffic congestion in Australia's two largest cities reached levels where major investment was considered necessary. BOOT schemes provide a method for governments to bring the required road works forward in time, without increasing general taxes or borrowings. Instead, the cost of construction and operation are met by charging a toll for the use of the road.
- The main benefit claimed for urban road BOOT schemes — earlier investment than that possible with public funding — depends on the appropriateness of constraints on increasing existing public funding levels.
- The case for urban road BOOT schemes can only be established by assessing their advantages and disadvantages relative to those of the alternative — public funding combined with competitive tendering and contracting out (CTC).
- Under CTC the government provides most of the finance, while BOOT projects access private finance. Other key factors that distinguish BOOT schemes from CTC relate to ownership and risk allocation. Under CTC, ownership of the urban road facility and the greater part of the risk usually remains with the public sector.
- A case-by-case assessment is required to establish which alternative is superior, given that there are opposing advantages and disadvantages.
- The contractual arrangements dealing with risk and uncertainty are critical to the relative effectiveness of BOOT schemes and the achievement of efficient outcomes.
- Several States have issued guidelines for private involvement in the provision of infrastructure. These are aimed at encouraging private investment in public infrastructure by outlining each State's policy and providing a framework for private involvement.
- There would be greater community understanding of the benefits of BOOT schemes if the results of the comparative assessment leading to the choice of funding arrangements are made transparent.

OVERVIEW

The private sector has recently become involved in the provision of major urban roads ...

Recently a number of major urban arterial roads have been built under Build, Own Operate and Transfer (BOOT) schemes. In Sydney, the projects are the Sydney Harbour Tunnel and the M2, M4 and M5 Tollways. Australia's largest BOOT project, Melbourne City Link, is currently under construction. The expected completion date for City Link is 1999. The total cost of these projects is over \$3.5 billion.

... through privately financed BOOT schemes.

A BOOT scheme is a contractual agreement between the private sector and the government. The private sector is given a *concession* to construct and operate an item of infrastructure for a specified period of time. Included in the contract is the right to charge users of the facility a fee (normally a toll in the case of urban roads) in order to recoup the costs of construction, maintenance and operation. At the end of the concession period the infrastructure assets are transferred to the public sector, typically at zero cost.

This study is an in-principle assessment of urban road BOOT schemes.

This study makes an in-principle assessment of Australia's experience with BOOT schemes for urban road provision. It is not an assessment of any particular project. For much of the assessment, BOOT schemes are compared with the next best alternative approach — competitive tendering and contracting (CTC) under public ownership — to identify their relative advantages and disadvantages.

Under CTC the government provides most of the finance, while BOOT projects access private finance. Other key factors that distinguish BOOT schemes from CTC relate to ownership and risk allocation. Under CTC, ownership of the urban road facility and the greater part of the risk usually remains with the public sector.

The growth of private involvement reflects the State's limited ability to fund major road projects.

State governments have been unable to finance all economically justified urban road projects when this requires a significant increase in current road funding. In addition, concerns over debt levels and the impact of increased levels of borrowing also limit the ability of State governments to fund major infrastructure projects.

Governments are sensitive to community expectations about responsible financial management and possible reactions by financial markets to higher levels of public borrowing. In addition, States' ability to borrow remains bound by perceptions that public borrowing is less desirable than private sector borrowing — despite private or public sector debt having similar economic effects.

State government responses to these pressures vary, with each determining the extent of its borrowing for infrastructure given their revenue raising constraints. Borrowing is justified for infrastructure projects because they are generally long-lived assets, and it is appropriate that future generations meet some of the cost. This creates a tension between the level of borrowing for infrastructure investment and the overall level of debt dictated by considerations of sound financial management. The challenge for State governments is to achieve the appropriate balance — that is, to ensure that the constraints they apply are economically efficient.

Recently, traffic congestion in Australia's two largest cities reached levels where major investment was considered necessary. BOOT schemes provide a method for governments to bring the required road works forward in time, without increasing general taxes or borrowings. Instead, the cost of construction and operation are met by charging a toll for the use of the road.

Consequently, private sector investment has been encouraged ...

Several States have issued guidelines for private involvement in the provision of infrastructure. These are aimed at encouraging private investment in public infrastructure by outlining each State's policy and providing a framework for private involvement.

... and the Commonwealth acted to redress a perceived bias against private investment.

In 1992, the Commonwealth Government introduced Infrastructure Borrowing Certificates (infrastructure bonds) to redress a perceived bias in the Australian taxation system against infrastructure investment. This scheme stimulated the use of urban road BOOT schemes and private sector provision of infrastructure generally.

In the 1997–98 budget this scheme was replaced with the Infrastructure Borrowings Tax Rebate scheme for land transport infrastructure, including roads. These new arrangements provide less support of road projects because total revenue forgone through the tax rebate scheme is capped at \$75 million.

The main advantage claimed for BOOT schemes is earlier investment.

Traditionally, road projects requiring large scale investment have been constructed in stages as funding constraints permit. BOOT schemes raise the entire capital 'up-front', hence they allow a project to be constructed in a single stage. The benefits of the new road, therefore, are available sooner than if the road had been publicly provided sometime later.

In addition, there may be gains from economies in construction when the whole road is built as a single project, rather than in stages as the funding becomes available. Single stage construction also minimises the attendant disruption to traffic during prolonged construction.

However, the perceived benefit of earlier investment is predicated on whether the decision to delay the project or to construct it in stages is appropriate. At issue is whether the fiscal constraints applied by governments are justified or whether private investment has inherent advantages over public provision.

BOOT schemes are also seen to be more cost effective ...

BOOT schemes can be instrumental in generating efficiencies in urban road development. This is because BOOT arrangements introduce capital market disciplines that may be absent from publicly-financed projects. BOOT operators face stronger financial incentives to minimise costs, build projects earlier and develop innovative solutions to financing, project design, construction, maintenance and operation.

... but CTC may offer similar efficiencies.

These advantages are not solely to be found in BOOT schemes — in part, they may potentially be accessed with publicly funded roads, when these are contracted out. The advantages specific to urban road BOOT schemes must be assessed on a case-by-case basis against the CTC alternative.

Future costs may arise because of the treatment of risk and uncertainty.

Risk, and particularly uncertainty, has been ameliorated by governments through the inclusion of *material adverse effect* clauses in BOOT contracts. This notionally transfers some of the cost of risk to the public in the form of a loss of flexibility — a loss of *option value* that potentially increases the cost of transport infrastructure in the future. There is also a potential for transactions costs to be incurred if the parties cannot quickly agree on whether a material adverse effect has occurred when the provisions are invoked.

That said, the use of BOOT schemes has required governments to rigorously take into account project risk.

Equity issues arise.

Urban road BOOT projects typically have concession periods of thirty years or more. This poses inter-generational equity issues because the investment decision commits future generations of road users to pay for the infrastructure through tolls. Long-term government debt may give rise to similar concerns. However, unlike tolls, general debt does not impact on particular individuals within the community.

In the longer term, road users benefit from the residual value of the asset without having to contribute to the construction through the payment of tolls. In addition, the development of road infrastructure may benefit members of the community who are not required to meet the costs of road construction through tolls. For example, if congestion of surrounding roads is reduced.

There may be efficiency costs ...

There are significant risks and uncertainties associated with BOOT projects for urban roads. Where risks are not appropriately allocated between the public and private sector, additional costs will arise.

Urban road BOOT schemes introduce a tolled road into a larger urban road network that is not directly priced. This may have two effects. First, traffic may not utilise the faster less congested new road to the full extent desirable. Second, the financial viability of a project may be threatened if toll avoidance results in actual revenues falling below expected levels.

... and potential gains may not be realised.

The limited number of firms able to participate in BOOT schemes for urban roads may limit competition in the bidding process. However, more firms will compete if private infrastructure development becomes widespread.

Competition diminishes once a proponent has been selected. In addition, there is only limited scope for technical innovation in road design and construction.

There are transparency and government accountability issues.

Currently, governments do not make available the assessments that form the basis for the decision to use a BOOT scheme in preference to other forms of financing and contracting. The NSW government requires contract summaries be tabled in Parliament. In the case of the City Link project, the Victorian government has made the contract public and variations subject to Parliamentary scrutiny. However, these measures do not provide the information required to allow independent scrutiny of the government's decision — thereby weakening

accountability.

More fundamentally, public justification has not always been provided in terms of the relative costs and benefits of the decision to use private rather than public finance. It is the economic and financial assessments that make the preceding decision-making process transparent.

A case-by-case assessment would be required.

Each urban road project is unique. At the very least governments should provide a case-by-case assessment of the benefits of each BOOT scheme against the alternative of public sector financing and contracting out. This should include information on the assessment of risk, and the identification of uncertainty. The appropriateness of the measures to mitigate risk and uncertainty should also be evaluated, including the identification of any contingent public liability.

Further research.

There are fundamental issues raised but not covered by this study. They relate to government road provision objectives, funding and regulation as well as the practices of road authorities. These are being addressed currently by the Commission in an international benchmarking study of government involvement in road provision.

1 AUSTRALIA'S RECENT EXPERIENCE

This Chapter provides a brief overview of Australia's recent experience with BOOT schemes for urban roads.

This study makes an in-principle assessment of Australia's experience with Build-Own-Operate-Transfer (BOOT) schemes for urban road provision. It is not an assessment of any particular project. The decision to provide a new road involves two stages — deciding whether the project is viable and, if so, how it should be financed. This report considers only the financing issue.

The relative advantages and disadvantages of public versus private investment in these projects are examined, as are the incentives to have the private sector bundle the financing and construction of large infrastructure projects. BOOT schemes for urban roads are also assessed against State government objectives for private sector involvement in the provision of public infrastructure.

1.1 Build, own, operate and transfer schemes for urban roads

Over the last decade BOOT schemes have been used in major urban road infrastructure development. BOOT schemes are one of a range of mechanisms developed to broaden the involvement of the private sector in the provision of public infrastructure. Other mechanisms include build-own-operate¹ and build-transfer-operate² schemes.

In substance, a BOOT scheme is a contractual agreement between the private sector and the government. The private sector is given a *concession* to construct and operate an urban toll road on land leased from, or provided by, the government. The rights and obligations of both parties apply for a predetermined period of time (termed the concession period) after which ownership of the facility and the responsibility for its operation revert to the

¹ Build-Own-Operate (BOO) arrangements are similar to a BOOT scheme in that the private developer builds, owns and operates a facility but there is no eventual transfer back to the public sector. The private sector owns the facility in perpetuity. This type of arrangement has not been used for the provision of roads in Australia.

² Build-Transfer-Operate (BTO) schemes are essentially a buy and lease back option where the public sector takes ownership of the project on completion and leases it back to the private developer. This type of arrangement has not been used for the provision of roads in Australia.

government. Typically, the agreement specifies that transfer of ownership is to occur at no cost to either party.

Included in the concession is the right to charge users of the facility a fee (normally a toll) in order to recoup the costs of construction and maintenance. In return, BOOT operators are obliged to meet the design specifications laid down by government. They must also ensure that the facility is maintained during operation, and to a predetermined condition, when ownership of the facility reverts to the government.

The obligations placed on government have varied between BOOT schemes but have generally been aimed at providing a degree of certainty for the operator. In Australia, government obligations have included redress for political and regulatory decisions — *sovereign risk* — and developments that adversely affect demand and, hence, the viability of a project. In some cases, governments have also underwritten the revenue earned by the project.

BOOT arrangements differ significantly from the more common approach of public ownership combined with competitive tendering and contracting (CTC). A major difference between CTC and BOOT schemes is the nature of financing arrangements. Under CTC, the government provides most of the finance, while BOOT projects access private finance. However, this distinction can be blurred where governments provide financial support to BOOT projects — especially when they carry some of the equity risk. The Economic Planning Advisory Commission (EPAC) noted that:

BOOT-type projects will be closer to contracting out the more they involve the government bearing risk ... (EPAC 1995a, p. 24).

Other key factors that distinguish CTC from BOOT schemes relate to ownership and risk allocation arrangements. Under a BOOT scheme, the private sector has ownership of the infrastructure facility during the concession period. Whereas, under CTC, ownership of the urban road facility remains with the public. In addition, governments shift some or all of the burden of risk onto the private sector under BOOT schemes. With CTC arrangements, the major share of the risk remains with the public sector. Key differences in the roles and responsibilities of the public and private sector for CTC and BOOT provision of infrastructure are summarised in Table 1.1.

Table 1.1 Comparison between BOOT schemes and CTC for the provision of urban roads

<i>Areas of involvement</i>	<i>BOOT schemes</i>	<i>CTC</i>
Planning	government	government
Design	private	private and or government
Construction	private	private and or government
Operation and Maintenance	private	private and or government
Ownership	private reverting to government	government
Payment of services	consumers and or government	consumers and or government
Regulate	government	government

Source: EPAC (1995c, p. 7).

1.2 BOOT schemes for urban roads in Australia

Compared with countries in North America and Europe, Australia has limited experience with urban road BOOT schemes. Currently, there are only five urban road BOOT projects in Australia — four of which are in Sydney and another in Melbourne. The NSW Government has not, to date, finalised and signed the contract for the construction of the Eastern Distributor project — potentially Australia's sixth urban road BOOT project.

Traffic congestion in Australia's two largest cities reached levels where investment in new urban arterial roads was considered necessary. In Sydney, projects built and operating under a BOOT scheme are the Sydney Harbour Tunnel and the M2, M4 and M5 Tollways. Australia's largest BOOT project, Melbourne City Link, is currently under construction. The expected completion date for City Link is the year 1999. The total cost of these projects is over \$3.5 billion. Detail on these infrastructure projects is in Appendix A.

*Invest Australia*³ suggested that urban road BOOT schemes are unlikely to proceed in States other than NSW and Victoria. The population densities of

³ The organisation comprises the Development Allowance Authority (DAA) and its Secretariat. The role of the organisation is to encourage investment in Australia. Its charter is to encourage improved international competitiveness of the Australian economy by means of two investment incentives — Develop Australia Bonds (infrastructure bonds), which have been replaced by new arrangements in the 1997–98

States such as South Australia, Western Australia and Tasmania are said to be insufficient for an urban toll road to be economically viable.

1.3 Incentives for BOOT schemes

Australian governments have encouraged private sector involvement in the development of public infrastructure through tax incentives and issuing guidelines. Governments have implemented these initiatives to develop the domestic capital market for infrastructure projects and to provide a framework that the private sector can follow when investing in these projects.

The major policy initiative introduced — *Develop Australia Bonds* scheme — has stimulated the use of urban road BOOT schemes and private sector provision of infrastructure generally. This scheme has been replaced by new tax rebate arrangements in the 1997–98 budget.

Public financial management incentives

BOOT schemes provide a method for governments to bring major road works forward in time, without increasing general taxes or borrowings. Instead, the cost of construction and operation are met by charging a toll for the use of the road.

BOOT schemes allow States to access private finance and avoid increasing the level of State debt. In the past, private sector financing has enabled governments to invest in major road infrastructure projects and remain within Loan Council limits (EPAC 1995a, p. 140). Loan Council arrangements have been revised since the EPAC report and current arrangements do not provide the same incentive to access private investment for infrastructure projects.

Traditionally, road projects requiring large scale investment have been constructed in stages as funding constraints permit. BOOT schemes, in raising capital ‘up-front’, allow projects to be completed in a single stage. This reduces the attendant disruption to traffic caused by prolonged staged construction which has been a feature of publicly financed roads. BOOT arrangements also introduce capital market disciplines that may be absent from publicly-financed projects. BOOT operators face incentives to minimise costs, build projects earlier and develop innovative solutions to financing, project design, construction, maintenance and operation.

budget, and the Development Allowance (an accelerated depreciation allowance) (Invest Australia 1997).

Capital market developments

The Commonwealth Government introduced infrastructure borrowing certificates (infrastructure bonds) in 1992 to redress a perceived bias against private sector infrastructure investment in the Australian taxation system.

Prior to the introduction of infrastructure bonds, many argued that stand-alone, non-recourse private infrastructure ventures were tax disadvantaged because their structure prevented them from immediately accessing tax deductions on interest and other costs (BIE 1990).⁴ For example, during the construction phase of an infrastructure project (typically up to 3 years and sometimes longer), cash flows are negative because the facility is not earning income while the project incurs interest and other expenses. The project company could not write-off these losses until it recorded positive income, many years into the future. There is an opportunity cost in deferring access to these tax losses as the funds can not be re-invested and they are exposed to inflation risk.

The infrastructure bond scheme was aimed at alleviating this perceived problem. Infrastructure bonds permit resident infrastructure financiers to apply for a tax rebate on interest received from infrastructure providers in return for the infrastructure providers forgoing the tax deductibility on that interest. The Treasurer stated that:

The intention of the scheme was for lenders to pass back the benefit of tax exempt interest in the form of lower lending rates (Commonwealth Office of the Treasurer 1997a).

Infrastructure bonds provided an indirect means for project owners to access tax deductions on their borrowing costs during the construction phase. The Australian Constructors Association noted that:

Infrastructure bonds resulted in lowering the overall interest costs for projects (easing cash flows) with borrowing costs being reduced by up to 40 per cent (Australian Constructors Association 1997, p. 15).

However, the Commonwealth Government replaced the infrastructure bonds scheme with the *Infrastructure Borrowings Tax Rebate* in its 1997–98 budget. The rebate scheme is essentially the same except for two conditions. The new program only provides assistance to land transport infrastructure projects. And the cost to the budget of the rebate will be capped at \$75 million per annum

⁴ Others, for example, Seiper (1995) have argued that these companies are not tax disadvantaged. The Commission is unable to form a view on the relative merits of the two arguments. This would require analysis beyond the scope of this paper.

(including running costs).⁵ In addition, the government's decision on a project's eligibility is final. There is no avenue for appeal (Commonwealth Office of the Treasurer 1997b).

Capital market developments are discussed further in Chapter 2.

State government guidelines

Five State governments — New South Wales (1995), Victoria (1994), Queensland (1992), South Australia (1994), and Western Australia (1992) — have attempted to formalise the private sector's involvement in infrastructure by issuing guidelines or policy statements.⁶

The principles set out in the guidelines include: efficiency and cost effectiveness; appropriateness of risk sharing; maximising competition in the bidding process; and encouraging innovation. Queensland and Western Australia are currently in the process of redrafting their guidelines.

State Government guidelines are discussed in Chapter 4.

1.4 Financial arrangements

BOOT schemes typically involve substantial investment. For example, the financial cost of the Melbourne City Link project alone is estimated at \$1.8 billion.

The private sector has tended to form consortiums for investment in urban road projects. These consortiums are usually formed expressly for the purpose of using non-recourse project finance. Under this financial structure, investors rely on the performance of the project for payment rather than the credit of the sponsor. Investors have limited recourse against the sponsor for payment if the project fails to generate adequate returns (Fishbein and Babbar 1996, p. 14). In the past, infrastructure bonds assisted non-recourse project finance structures by providing cheaper debt during the construction phase of the project, when investors perceive the risk to be higher and therefore demand a premium.

⁵ In contrast, the Treasurer estimated that, at the time of closing the infrastructure bond scheme the revenue cost to the Commonwealth over three years could be in excess of \$4 billion if all current applications were certified (Commonwealth Office of the Treasurer 1997a).

⁶ The guidelines relate to private involvement in the provision of public infrastructure in general and are not road specific.

The main benefit of a project finance structure is that it enables the sponsors to heavily gear a BOOT project. This is particularly important during the construction phase when the project does not generate revenue:

A primary benefit of project finance structures is that they allow sponsors to leverage their resources and expertise with outside capital in order to undertake projects that they otherwise would not be able to finance on the strength of their own balance sheet (Fishbein and Babbar 1996, p. 15).

These financial structures also allow sponsors to share project risks with lenders and keep the project debt off their own balance sheets. Governments can limit their liability through non-recourse project finance, except when they provide financial assistance to the project through loans and minimum traffic and revenue guarantees (Fishbein and Babbar 1996, p. 15).

The major financiers and underwriters of BOOT projects in Australia have been the four major Australian banks — National Australia Bank, Commonwealth Bank of Australia, ANZ Bank and Westpac Banking Corporation. However, international banks have been involved in the arrangements for the Melbourne City Link project.

1.5 Previous studies

In 1994, the Prime Minister directed EPAC to establish a task force to report on private sector involvement in the funding management and control of public infrastructure. The report examined private involvement in all forms of infrastructure and was not road specific. The report, released in 1995, concluded that:

Governments should not presume that either the private or the public sector can deliver projects more efficiently. For each project they should assess whether public ownership with contracting out, a BOOT-type arrangement or full privatisation best meets the community's needs (EPAC 1995c, p. xii).

However, analysis by EPAC led it to conclude that urban road BOOT projects are less likely to deliver benefits to the community than public ownership, combined with contracting out. Governments should support private involvement in infrastructure in other areas that are likely to deliver greater benefits.

... BOOT-type structures are likely to be least advantageous for urban roads.
... the incremental efficiencies from private ownership are likely to be smaller in roads than in other sectors and the private financing cost penalty more pronounced owing to greater network risk and higher transaction costs.

... the Task Force sees greater intrinsic advantages in the BOOT approach in some other sectors — particularly water and electricity. In these areas, significant synergies can be captured from bundling construction and operation with private ownership. And, particularly in the case of water, the risk to project revenues from developments elsewhere in the network is probably smaller than in roads (EPAC 1995c, p. 45).

Despite these findings, EPAC (1995c, p. 45) conceded that there may be circumstances when BOOT schemes are appropriate for urban roads. For example, when governments face short-term budgetary constraints that prevent them from financing worthwhile projects in a timely fashion.

The NSW Auditor-General has prepared reports on several BOOT schemes for public road infrastructure in that State. These have included performance audits of the Sydney Harbour Tunnel project, the M2, M4 and M5 Motorways. The Auditor-General's views are summarised in NSW Auditor-General (1996).

The Auditor-General has raised several concerns with the use of BOOT projects for the provision of urban roads. Of particular concern is the nature of the road network within which the BOOT road operates and its implications for the sharing of risks between the government and the private BOOT operator (NSW Auditor-General 1996, pp. 20–22).

These network and risk sharing issues are explored further in this study.

1.6 Objectives of the study

The Commission makes an in-principle assessment of BOOT schemes for urban road provision in Australia, drawing on experience with projects in NSW and Victoria. These are the only States that have used these schemes. It is not intended that the analysis be an evaluation of any particular project.

The Commission builds on the EPAC study by focusing in more detail on the advantages and disadvantages of BOOT projects for urban roads in light of recent experience with these projects in Australia.

The benefits and costs of BOOT schemes are assessed against public ownership combined with CTC. The latter provides a suitable benchmark because it is a form of private sector involvement used extensively for urban road projects. Importantly, it enables a comparison of private versus public financing of urban road projects.

The nature of factors which limit the ability of State governments to finance urban road projects are discussed (Chapter 2). Also examined is the nature of factors influencing access to private financing of urban roads.

The advantages and disadvantages of using BOOT schemes in urban road projects are discussed (Chapter 3).

BOOT schemes are assessed against selected State government objectives for private sector involvement in infrastructure development (Chapter 4). The transparency of government processes is also discussed.

A summary of each BOOT road project is given in Appendix A. During this study Commission staff held discussions with a range of stakeholders to ascertain the relevant issues and collect background information. A list of those visited is presented in Appendix B.

2 FINANCING URBAN ROADS

In this Chapter, public and private road investment is examined to identify some of the possible financial reasons why governments have made use of BOOT schemes for urban roads. Central to this is the treatment of risk and its financial implications for private financing through BOOT schemes.

Other possible reasons related to cost effectiveness are discussed in the Chapter 3.

In Australia, all levels of government play a role in the management of the road system. The Commonwealth Government is responsible for the National Highway System (NHS), the State and Territory governments are responsible for major urban and rural arterial roads, and local governments are responsible for other arterials and local roads (Austroads 1997a, p. 22).

Under the current system, the Commonwealth Government collects most of the revenue associated with road use through its fuel excise levy. However, State and local governments account for approximately two thirds of total road expenditure in Australia.

Since 1994, the Commonwealth Government has provided untied general revenue assistance through identified road grants. State and Territory governments can spend these grants according to their own budgetary priorities.

State governments have little direct influence over the level of Commonwealth funding. However, they can fund roads through their own revenue base or take advantage of private financing through other avenues such as BOOT schemes.

2.1 Public funding of major urban road projects

The urban road projects that have been funded through BOOT schemes typically involve large capital expenditures that require a significant increase in current road funding. For example, the Melbourne City Link project is estimated to cost \$1.8 billion over five years, while the Victorian Government spends approximately \$1 billion each year on roads (BTCE 1996). Consequently, it is difficult for governments to finance these projects from existing financial resources by reallocating funds from other uses.

The public finance options available to government are to increase the general level of public borrowing or increase the taxes and charges on road users. These options are canvassed in this section for the purpose of examining why some governments have chosen to use private financing for some projects.

Public borrowing

State governments appear to be reluctant to increase public debt because the need to service the additional debt affects their ability to provide other services. Governments are also influenced by credit ratings. In addition, governments face perceptions that public borrowing is less desirable than borrowing by the private sector — despite the macro-economic effect of using either private or public sector debt being the same from an economic viewpoint.

Credit rating and debt concerns

Concerns over debt levels and the impact of additional borrowings limit the ability of State governments to fund economically justified infrastructure projects. This is particularly the case today, as governments are sensitive to community expectations about responsible financial management and possible reactions by financial markets and credit rating agencies to higher levels of public borrowing.

Credit ratings are important to State governments because the rating influences the interest rate which must be paid on government borrowings. The lower the credit rating the higher the interest rate the State must pay on borrowings.

A factor determining a State's credit rating is the ratio of its net debt to gross product. Therefore, one avenue for a State to improve its credit rating is to reduce its level of debt. States intending to retain their current rating are cautious about increasing indebtedness.

Borrowing for costly projects, such as those financed through BOOT schemes, may worsen a jurisdiction's credit rating leading to a higher cost of financing new projects and increased interest payments on outstanding debt. The cost of building an additional road, if financed by government borrowing, is not only the current cost of capital for the project but potentially an increase in the cost of additional debt and existing debt when it is rolled over.

Moreover, State governments and the community appear to regard the State's credit rating as an indicator of fiscal management or general economic performance. They are concerned that a downgrading of the State's credit rating will be interpreted as poor fiscal management.

EPAC (1995a, p. 142) noted that financial markets so severely discipline government borrowings that, in EPAC's view, there is now a bias against public financing of infrastructure projects. If this remains the case, governments that emphasise debt reduction are likely to have a strong preference toward private sector involvement.

State Government responses to these pressures vary, with each determining the extent of its borrowing for infrastructure given their revenue raising constraints. Borrowing is justified for infrastructure projects because they are generally long-lived assets, and it is appropriate that future generations meet some of the cost. This creates a tension between the level of borrowing for infrastructure investment and the overall level of debt dictated by considerations of sound financial management. The challenge for State Governments is to achieve the appropriate balance — that is, to ensure that the constraints they apply are economically efficient.

Loan Council

In recent years, the Loan Council has varied the approach adopted for monitoring and reporting public sector borrowing by jurisdiction.¹ The pre-1993 arrangements, which focused on global limits, had become less effective as State governments used sophisticated financing techniques to circumvent Loan Council coverage (Loan Council 1993). As EPAC noted:

A desire to circumvent these limits ... led some State governments to involve the private sector in infrastructure projects, irrespective of whether there were efficiency benefits from doing so (EPAC 1995a, p.140).

In 1994, a new approach was adopted which aimed to establish a more transparent framework based around government budgetary circumstances. Its main features included:

¹ The Loan Council comprises both Commonwealth and State government representatives. Its function is to monitor and report on borrowings by State governments, the Commonwealth, State Government Business Enterprises (GBEs) and Local government authorities to ensure a responsible and cooperative approach to both the level and nature of public sector borrowing. The common interest of the representatives is to ensure that overall public sector borrowing in Australia is consistent with sound macro-economic policy and that borrowings by each jurisdiction are consistent with a sustainable fiscal strategy (Loan Council 1993).

- A focus on a jurisdiction's net borrowings as indicated by a jurisdiction's deficit or surplus. This is intended to be a more meaningful indicator of the impact of a jurisdiction's borrowing on the economy.²
- A method of allocating borrowing levels to jurisdictions that takes into account fiscal circumstances, infrastructure requirements and capital needs of particular jurisdictions.

Under this approach, jurisdictions informed the Loan Council Secretariat of their degree of risk exposure in infrastructure projects involving the private sector. Where the public sector bears significant risk exposure, the project borrowing is included in the jurisdiction's Loan Council Allocation (LCA).³

The risk weighted approach to the treatment of private involvement in providing public infrastructure was revised in 1996 following problems with the valuation of project assets on a consistent basis. Under the revised arrangements, the public sector's exposure to infrastructure projects with private sector involvement is the public sector's full contingent exposure as measured by a government's termination liabilities. In addition, the termination liabilities are disclosed as a footnote to, rather than a component of, the LCA.

The Commission did not investigate the matter in detail, but notes that, in principle, the current approach should have less of a dampening effect on State government borrowing than the previous approach.

Prima facie, the past approaches may put in place incentives for governments entering into BOOT schemes to ensure that, as far as practicable, all of the risks are borne by the private operator. Governments have generally insisted that BOOT operators carry the risk. However, there is no evidence to suggest this was a response to minimise the impact on the State's borrowing allocation. Under the current Loan Council arrangements there is likely to be little incentive to shift risks.

Macro-economic effects

Some States may be reluctant to borrow for urban road projects because of perceptions that public borrowing 'crowds-out' private sector borrowing in

² The jurisdictions covered by Loan Council arrangements include the Commonwealth, States and Territories.

³ Each jurisdiction informs the Loan Council of its intended borrowing. This is referred to as the Loan Council Allocation (LCA) for that jurisdiction. The Loan Council then considers the appropriateness of the nominated LCA for each jurisdiction.

other areas. EPAC ruled this out as an economically justified influence on government funding of infrastructure projects:

For any given project, the macro-economic effects of using private and public finance are basically identical. Any 'crowding out' effects and any impact on the current account deficit are the same in both cases, as the underlying levels of national saving and investment are unaffected. If an infrastructure investment offers high economic expected return it will confer more benefits than costs on future generations, and it should not matter on macro-economic grounds whether it is financed through the private or public sector.

This in turn implies that there is no real advantage from using private sector finance if no risk transfer takes place. The only impact would be to disguise the actual financial position of the public sector as, in substance, the expected future costs and benefits are the same (EPAC 1995a, p. 66).

The choice between public versus private financing of road projects should be based on how best to provide the road efficiently, rather than on a perception that public sector borrowing results in adverse macro-economic effects. However, it must be recognised that financial market and public perceptions of the relative merits of public and private sector borrowing may limit the ability of State governments to borrow for worthwhile road projects.

At issue is whether the fiscal constraints applied by governments are efficient or whether private investment has inherent advantages over public investment.

Increased taxes and charges on road users

In the case of urban road BOOT schemes, the projects have been economically warranted and financially viable given Commonwealth and State government support. Consequently, concerns about public debt may not be the only reason for favouring private investment.

Governments are generally reluctant to fund major road projects through direct road use charges such as tolls. One possible explanation for this reluctance is that motorists perceive they already pay too much in taxes, fees and charges for their road use (Australian Automobile Association 1995). Another possible reason is that taxation is a more efficient and equitable method of financing new urban road projects in the absence of a suitable mechanism to efficiently and equitably charge road users.⁴ Governments may also be reluctant to increase taxation because not all taxpayers will benefit from the projects.

⁴ A further difficulty is that road users are not the sole beneficiaries of roads. Consequently, a decision is required on what proportion of costs should be recovered from road users.

In the absence of an efficient *user pays* mechanism, State governments are faced with increasing taxes or charges to publicly finance major road projects. Some governments have chosen to fund road investment programs by earmarking the revenues from special purpose charges on road users — typically fuel charges levied as business franchise fees on petroleum wholesalers.⁵ Moreover, the road projects have been distributed over the State, thereby ensuring all contributing road users benefit.

In the case of BOOT projects, however, not all road users or taxpayers are beneficiaries of the considerable benefits that flow from the projects. Thus, on equity grounds and because of the need to provide a return on the private investment, tolls have been favoured as the funding mechanism.

2.2 Private road financing

There are several costs associated with financing capital projects. Some of these costs are common in both public and private sector finance. The best mode of financing is the one that minimises costs to road users and taxpayers.

The sources of cost differences in the case of BOOT projects are risk and uncertainty, taxation treatment, transaction costs and capital market maturity. The differences in costs are examined in this section.

Risk and uncertainty

The reasons why the net cost of public and private finance can vary with risk are:

- differences in the ability and willingness to bear project-specific risk;
- incentives that the pattern of risk bearing induces; and
- the returns that have to be offered to debt and equity holders.

BOOT projects involve risk and uncertainty. There are five main types of risk identified with large urban road projects:

- *Construction risk*, that arises because of uncertain conditions such as those associated with major earthworks, tunnels and foundations to major bridges.
- *Technological risk*, that arises when untried technologies are used.

⁵ Since mid 1997, this form of indirect charge can no longer be applied by State and Territory governments.

- *Traffic risk*, that arises because of uncertainty about future levels of demand for the road services provided under the project.
- *Network risk*, a special form of traffic risk, that arises when there are changes in other parts of the road network that affect, in a positive or negative manner, traffic flows on the BOOT road.
- *Sovereign (political) risk*, that arises from changes to government policy.

Much of the ‘risk’ in BOOT urban road projects arises because of uncertainty.⁶ In the case of uncertainty, a probability can not be assigned to the event. Uncertainty arises because there has been too little experience of such events to be able to assign a probability to their occurrence or there is no prior knowledge because of ongoing unpredictable change.⁷

Ability and willingness to bear risk

The following discussion is related to *undiversifiable risk*. Its existence affects the willingness to invest.⁸ This willingness is affected by the ability of the investor to bear risk.

Notionally risk can be regarded as imposing an economic cost — *the cost of risk*, often referred to as the *risk premium*. The risk premium reflects the inducement an investor requires to be indifferent to a ‘risky’ project and an investment with no risk. Alternatively, a discount rate, which reflects relative risk, can be adopted that produces an equivalent present value of the project.

The economic cost of risk should not be confused with the cost (or benefit) of changes to the profitability of a project. Any change to financial outcome will be the same (other things being equal) irrespective of whether the project is publicly or privately financed. For example, the subsequent ‘costs’ of errors in the estimation of future levels of traffic is not affected by whether the road is privately or publicly owned.

Although the cost of risk can be taken into account in investment evaluation, its estimation is not straight forward. That said, investors reach judgements about the extent of the risk and what they require to compensate them for bearing that risk. Where uncertainty exists the cost of risk can be expected to be higher because the expected return cannot be estimated.

⁶ Technically, risk is distinguished from uncertainty by the ability to assign an objective or subjective probability of the risky event occurring, based on past experiences.

⁷ An important consequence of this distinction between risk and uncertainty is that with the latter it is impossible to calculate a probabilistic expected return for the project.

⁸ Undiversifiable risk is the systematic or ‘market’ risk plus the project-specific risk that cannot be diversified.

Governments are regarded as being in a position to be more risk neutral than private sector firms.⁹ This is explained by the ability to *spread risk* across the population and, to a lesser extent, to *pool risk* across a large portfolio of capital projects.

This does not imply that governments should undertake all activities that are risky. In some cases, the private sector will have greater expertise to manage risk. Moreover, there are practical limitations to the ability of governments to be completely risk neutral.¹⁰

There are also theoretical limitations to government bearing other forms of risk such as production externalities — the cost of which are borne by other consumers or producers.¹¹ In the case of a road network, externalities arise because roads form a road network and roads are usually part of a broader transport network. For example, a project in the private sector can affect the welfare of a private sector provider of a road elsewhere in the network — either adversely or beneficially.

That said, the economic cost of risk to governments is likely to be lower in the case of major urban road projects of the type that have been financed through BOOT schemes. This will be reflected in a higher project cost if governments use BOOT schemes because private sector investors are more risk averse and, consequently, will require greater compensation to bear the risk.

This implies that the public sector should be more willing from an economic perspective, all things being equal, to invest in a project than the private sector. This is particularly the case for BOOT schemes, which are provided through

⁹ This phenomena is explained by the Arrow–Lind theorem which states that the risk attached to any single project funded by Government is spread across people thus making governments risk neutral. That is, the large number of taxpayers results in a small risk burden on each. See Arrow and Lind (1970).

¹⁰ The Arrow–Lind theorem relates specifically to financial risk. The population is finite, albeit large, and there are limits to which individuals can bear financial risk. Governments are also unlikely to adjust taxes up and down according to the net financial flow of their portfolio of projects.

Governments cannot be risk neutral, also, when there are option values on assuring that a goodwill be available in the future if it is required. That is an option value exists under risk neutrality.

¹¹ Production externalities exist where production activities of one agent have a direct effect on the production of another. Risks associated with externalities are not necessarily spread across a large number of taxpayers. The Arrow–Lind theorem also holds only for private goods — in the case of public goods the risk is invariant with the number of taxpayers.

single-purpose stand-alone companies that do not have large and diverse portfolios to spread risk.

The difference in the cost of risk between publicly and privately financed urban road schemes is difficult to assess. As discussed in Section 2.1, government's investment is constrained. For example, the cost of capital to governments could potentially be increased by a large road project.¹² In addition, the cost of capital to the private sector depends on how effectively they are able to diversify project risk and uncertainty through measures such as insurance and contractual limitations on responsibility for risk bearing.

One way to a fund capital works and avoid having to commit to large projects is through planning and gradual upgrading of urban roads in a financially responsible and manageable way. This would involve maintaining a capital program that obviates the need for a major increase in the level of investment from time to time. Greater transparency would also assist. It would require governments to justify their decision not to proceed with projects that clearly have significant economic merit.

Pattern of risk bearing

Another reason for differences in the cost of risk is that the *ability and incentive to control project-specific risks* will vary between the public and private sector. Hence the often quoted rule — risk should be borne by whoever is in the best position to control the risk.

Imposing a pattern of risk bearing that is not aligned with the ability to control these risks unnecessarily increases risk and its cost. Furthermore, incentives can arise for one party to increase the overall level of risk at the expense of the other party.¹³

Given the impact of future government policies on the viability of particular projects, governments are often in a better position to ameliorate risks associated with urban road projects than the private sector. Many of the risks are under government control such as *sovereign risk*. Governments are also in a better position to control the *network risk* and *traffic risk*, but to a lesser degree.

Construction risk and *technological risk* are likely to be the same for both public and private investment. Both governments and BOOT scheme operators typically contract out construction and could be expected to engage

¹² The marginal cost may be greater than the increase in the capital charge for the project because other cost borrowing on other investment is potentially affected.

¹³ Referred to as *moral hazard* by economists.

the same providers of new technology. Therefore, both under public and private investment, risks are borne by the construction contractor.

Overall, it can be expected that the project risk would be greater for the private sector. In EPAC's view:

... project specific risk may be greater for the private sector in some circumstances. In particular, the risk attaching to a private infrastructure project which is part of a publicly owned network will generally be higher than for a similar project undertaken by the network owner. This is because the private owner of a single project will face greater potential variations in demand due to developments elsewhere in the network than will the network owner (EPAC 1995c, p. 43).

This has implications for the economic cost of risk. If the private sector is required to bear risk that it cannot control, the economic cost of risk — the additional compensation required by the private investor to bear risk over that required by governments — will be higher than it would be otherwise.

Risk, and particularly uncertainty, has been ameliorated by governments through the inclusion of *material adverse effect* (MAE) clauses in BOOT contracts.¹⁴ These typically provide for a menu of responses that escalate from changing tolls or the length of the concession period to direct government financial compensation.

MAEs notionally transfers some of the cost of risk to the public in the form of a loss of flexibility — a loss of *option value*. There is also a potential for transaction costs to be incurred if the parties cannot quickly agree on whether a MAE has occurred if the provision is invoked.

The loss of option value may be the most significant cost of BOOT schemes. For example, governments have also taken action to mitigate uncertainty by such measures as retaining the option of building a competing railway. In other cases, governments have taken steps to limit the use of alternative roads — however, this measure may also be aimed at improving the financial viability of a project.¹⁵

MAEs reduce the underlying risk and the compounding effect it has on the economic cost of risk to the private sector. However, where this has resulted in a loss of option value, the saving in the cost of risk will have been off-set to

¹⁴ The main purpose of the material adverse affect clauses is to overcome moral hazard on the part of the government, that is, to protect the BOOT scheme operator from sovereign risk.

¹⁵ Tolls for urban road projects only allow the provider to charge what the market will bear for the increment of service provided over that of alternative services.

some degree. Clearly, assessments of the relative merits of public and private investment in roads should take this into account.

The arrangements for the Melbourne City Link project highlight the use of MAEs (see Box 2.1). The aim of these provisions is to provide Transurban and its financiers with some degree of certainty by specifying methods of redress that reinstate the financial position of the project (Victorian Auditor-General's Office 1996, p. 121).

Using MAE clauses may be appropriate since the government is best able to manage traffic flows on the road network. However, MAEs commit governments to particular courses of action for long periods of time. Such long-term commitments may be against the public interest if further necessary development of transport infrastructure is prevented. For example, the MAE clause of the City Link project does not require the Victorian Government to compensate the City Link developers if a heavy rail link between Melbourne city and the Tullamarine airport is built.

Although MAEs can impose long-term costs, these costs may be acceptable to the government compared to the long-term benefits generated by the developed infrastructure. Furthermore, EPAC argued that compensation may be difficult to apply in practice and highlighted the NSW Audit Office concerns in regard to the M2:

... the restoration clause cannot entirely reduce the risks ... Whether or not any improvement in the road network around the M2 detracts from the viability of the M2 might be difficult to determine. Such improvements would be only one of a number of changes (employment, weather, seasons, tourists, migrants, wages, petrol costs) that can affect traffic volumes (NSW Audit Office quoted in EPAC 1995a, p. 76).

Box 2.1: Material Adverse Effects clause in the City Link project

The arrangements for the Melbourne City Link project identify a number of events that may have a materially adverse effect on the project's financial viability but which are beyond the control of Transurban (the City Link developers). These events include:

- acts or policies by the State or its agencies which prevent or hinder the implementation of the project;
- changes in or new (State or Commonwealth) laws and agency requirements, or changes in the application of existing laws, which have a specific and demonstrable effect on the project, but excluding tax changes which affect business generally;
- the removal of certain agreed traffic management measures by the State;
- changes to the transport network or in transport policy which could adversely impact on the Link;
- industrial action directed at the project resulting from State Government acts or policies;
- riots, blockades or other forms of civil commotion;
- establishment of a heavy rail link between the city and Tullamarine airport;
- unidentified pollution or contamination of project land;
- heritage claims on the land;
- force majeure events which impact upon the Link;
- combination of any of these events; or
- removal of advertising rights.

Methods of redress negotiated between Transurban and the Victorian Government to address the effects of these events include:

- amending the toll calculation method;
- increasing the concession period;
- altering the risk allocation between the parties under the arrangements;
- rescheduling or altering concession payments due to the State;
- requesting the project lenders to restructure the financing arrangements;
- financial contribution by the State, generally only available as a measure of last resort; and
- other methods of redress as agreed between the parties.

Source: Victorian Auditor-General's Office 1996, p. 119-120

The World Bank noted that compensation mechanisms may not alleviate uncertainty:

... private concessionaires generally assume the risk associated with dispute resolution and the ability to obtain compensation in the event of a government violation of the concession agreement (World Bank 1996, p. 13).

An alternative mechanism that may be employed to reduce uncertainty of future revenues is traffic management measures. Traffic management measures, such as road closures or road narrowing, introduced to the network surrounding a BOOT road encourage traffic onto the toll road. Traffic management may benefit local residents by reducing traffic flow in their area, as well as reducing uncertainty about traffic and revenue levels for the BOOT operator.

Governments may be willing to enter into arrangements that reduce the uncertainty of the operating environment to secure private sector financing of a project. Indeed, where projects have become highly politicised because of the public profile given to them by the government, governments may have a perverse incentive to manage further development of the road network in a way that guarantees the success of the BOOT project.

Greater transparency in the road planning approval process would address such concerns.

Returns to debt and equity holders

Governments are able to access capital for their general borrowing at a lower cost than the private sector and in particular BOOT scheme operators.¹⁶ This advantage is a reflection of governments' abilities to service debt because of their power to tax and the guarantee to repay.

The extent to which the public sector can access capital at a lower cost reflects, in part, implicit risk bearing by taxpayers. EPAC, in commenting on this, said:

... a significant part of the difference in public and private financing cost most likely reflects the fact that taxpayers are providing an implicit guarantee for project risks under public ownership (EPAC 1995a, p. 74).

The difference in the cost of capital also reflects the cost of intermediation. These costs arise because investors in private infrastructure businesses sometimes incur transaction costs in obtaining information and monitoring the borrower. They also have regard for the management capability of the business (a start-up business in the case of BOOT schemes).

¹⁶ Governments typically have better credit ratings than BOOT operators.

The risk under consideration is the undiversifiable market risk on financing assets — distinguished from specific project risk which is usually assumed to be fully diversified.¹⁷ Another source of differences in the public and private cost of capital is the diversification of project risk. In the case of BOOT projects, the project-specific risk is unlikely to be diversified costlessly. Insurance providers incur transaction costs and are unable to diversify cost to the same extent as governments. Indeed, some of the risk may not be diversified at all. Transurban indicated that they have not diversified some of the risks not covered by the MAE clauses — for example some of the perceived *sovereign risk* and *force majeure*.

These differences in the cost of public and private capital are likely to be proportionally lower for large projects because of the fixed nature of the additional costs faced by the private sector. Consequently, the additional cost of capital may not have been very significant for the large urban road BOOT schemes currently in operation.

Differences in the cost of controlling risk and the loss of option value may be more significant and warrant further investigation.

State governments may have been prepared to accept the higher cost of capital. They have been able to shift some of the costs to the Commonwealth by taking advantage of incentives provided through reduced taxation. To the extent that costs are shifted, they are borne by the Australian community.

Taxation issues

Taxation arrangements can affect access to private funds and the cost of those funds for urban road projects.

Income deferred projects and investment incentives

Urban road BOOT schemes in Australia have been undertaken by special purpose stand-alone companies. The stand-alone company is usually formed as a joint venture between several parent companies. The implication of this structure is that the stand-alone company can only offset tax losses against income derived from the road project. Losses cannot be offset against any other income earned by the parent companies in the joint venture.

Road projects are characterised by long construction and start up periods before any income is earned. Tax losses and expenses incurred during the early stage of the project must be carried forward and offset against future

¹⁷ Usually referred to as *unique risk* to differentiate it from *systematic market risk*.

income earned by the road project. Nevertheless, over time the value of the accrued tax losses declines, especially in periods of significant inflation. It has therefore been argued, for example, by *Invest Australia* (1997), that these projects are tax disadvantaged.

Macquarie Corporate Finance (1995, pp. 19–20), for example, argued that investing in deferred income projects such as toll roads is less attractive from a tax viewpoint than other projects where tax losses can be accessed immediately.

On the other hand, some argue that deferred income projects are not tax disadvantaged (see for example Sieper 1995). They claim that the effective tax rates faced by stand-alone and other infrastructure companies are roughly equivalent. This argument is largely predicated on the assumption that tax free capital gains accrue to stand-alone companies.

The issue appears to remain unresolved. The Australian Constructors Association after assessing the literature concludes:

... the argument that infrastructure projects (especially stand-alone projects) are not tax disadvantaged is at best unproven, and at worst very highly questionable (Australian Constructors Association 1997, p. 17).

The Commission has not attempted to assess the relative merits of the two sides of the debate for this study.

The Commonwealth introduced arrangements to partially offset the perceived disadvantage which may impact on deferred income projects. Infrastructure Bonds (originally referred to as Develop Australia Bonds) were introduced in 1992 to overcome the perceived tax disadvantage suffered by stand-alone companies investing in deferred income projects. Income earned on the bonds by investors was non-assessable for income tax purposes while the interest cost for the borrowers was non-deductible.

Infrastructure bonds have succeeded in reducing the private sector's borrowing costs for infrastructure projects at a cost to taxpayers. The Australian Constructors Association argues that in early 1997:

... the cost of borrowing via Develop Australia Bonds was about 60 per cent of the cost of conventional borrowings. There can be no doubt that infrastructure bonds succeeded in lowering project borrowing costs (Australian Constructors Association 1997, p. 18).

This scheme stimulated the use of urban road BOOT schemes and private sector provision of infrastructure generally. As of 28 April 1997, the Development Allowance Authority (DAA) had issued infrastructure bonds for three tollway projects — M2 Motorway, Melbourne City Link and Eastern

Distributor Toll Road. The M2 Motorway was the first project the DAA approved under the new infrastructure borrowing program. The approval enabled the tollway company to raise \$148.5 million of infrastructure borrowings for the project. Total expenditure on the project is estimated to be \$500 million. The Melbourne City Link project has used infrastructure bonds more extensively. It has direct borrowings of \$1.25 billion, of which \$455 million are in equity infrastructure bonds and \$795 million in direct infrastructure borrowings (Invest Australia 1997).

After examining the effects of the infrastructure bond scheme, the Commonwealth Office of the Treasurer found that infrastructure bonds were being used for aggressive tax minimisation schemes by high income earners. A press release by the Treasurer stated that an examination of applications for infrastructure bonds found 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 (Commonwealth Office of the Treasurer 1997a).

In 1997, the infrastructure bond scheme was replaced by the infrastructure borrowings tax rebate. This mechanism permits:

... resident infrastructure financiers to apply for a tax rebate on interest received from infrastructure providers in return for the infrastructure providers forgoing the tax deductibility on that interest (Commonwealth Office of the Treasurer 1997b).

The cost of the new program is capped at \$75 million annually (including running costs) (Commonwealth Office of the Treasurer 1997b).

Transaction costs

The transaction costs involved in arranging finance for BOOT road projects are likely to be greater than for corresponding projects which are publicly financed. These transactions costs arise from having to negotiate the concession contract and arrange the private financing package. These costs are in addition to those incurred with public provision. Insufficient data are available to determine whether the expected reduction in transactions costs has occurred as more experience is gained with BOOT projects.

The transaction costs associated with BOOT projects stem, in part, from the preparation and finalisation of contracts. Substantial time and resources are consumed in negotiating risk allocation and other intricacies in the contractual

arrangements. For example, in relation to the M2 project contractual arrangements:

... involved the preparation of 22 separate contractual documents representing the interests of the RTA, the Minister, the construction joint venture, the debt underwriter and debt providers, the equity underwriter and equity subscribers, the M2 Motorway Trust, the trust manager, the trustee, a security trustee, a lessor, a lessee, concurrent lessor and concurrent lessee and various mortgagors and mortgagees (Wood quoted in EPAC 1995c, p. 44).

Some of these costs may also occur in publicly funded road projects. However, it has been suggested that they are relatively higher for BOOT projects. Public sector financing does not have such high contracting costs and transactions cost as risks are borne by a single party (the public sector). In particular, the public sector bears the traffic risk and the cost of reducing uncertainty. It is negotiation over the allocation of this risk which results in much of the high transactions costs incurred by BOOT schemes for urban roads.

The cost of designing complex financial arrangements for the project is an additional cost largely borne by private providers of infrastructure. For example, EPAC noted that:

The prospectus for the M2 Motorway indicates that the cost of raising around \$350 million of private equity for the project was around \$26 million. These costs include \$4.7 million for underwriting the share issue, \$1.2 million in legal costs and \$4.5 million to Macquarie Corporate Finance for advising on the project (EPAC 1995a, p. 78).

These financing costs, aimed at achieving the best deal for the private BOOT operators, may not necessarily result in the best deal for the community as a whole. For example, the financial package may be structured to maximise access to concessional taxation arrangements, the effect of which is to lower the financing costs to the private consortium by shifting some cost onto taxpayers.

Another transaction cost is the need to duplicate feasibility and traffic studies to provide greater certainty to the private sector participants. Some of this cost may be offset by improved traffic forecasts if the information is shared.

Capital market maturity

In the case of urban road BOOT schemes, the cost of risk is likely to be higher in the short-run. The market for financing infrastructure projects is still developing. Consequently there is little experience to draw on for the

assessment of market maturity. Even when the market matures, difficulties will persist because each project is likely to have unique features.

The capital market for BOOT projects in Australia has matured, with successive projects. This has resulted in lower financing costs with greater risk acceptance by the private sector. This trend is likely to continue.

Initially, financiers of BOOT projects, in particular banks, were cautious as they were unfamiliar with the risks of BOOT projects for roads. Consequently, they expected to charge a higher premium. In addition, the thin bond market adds to the costs of raising finance. The large bond issue associated with the M2 resulted in an oversupply of bonds, with the result that the price of the bonds fell and the interest rates (or yield) offered on those bonds increased.¹⁸

There is evidence that as the capital market has matured the cost of privately funding infrastructure projects has declined. For example, the Australian Constructors Association presented data on the percentage reduction in borrowing costs associated with infrastructure bonds. They argue that the maturing of the capital market for infrastructure projects is demonstrated by:

... the progressive reduction in costs to infrastructure borrowers over time, reflecting a market better informed about tax exempt bonds, greater retail appetite for them, and consequently reduced costs of underwriting and distribution (Australian Constructors Association 1997, p. 18).

The cost of private finance for BOOT road projects commenced during the relatively 'less mature' period of the market is likely to have been higher than if the project had been undertaken more recently. For example, data on the efficiency of infrastructure bonds presented by the Australian Constructors Association (1997, p. 18) indicates that infrastructure bonds resulted in a 31 per cent reduction in borrowing costs for the Melbourne City Link project. However, the reduction in current (that is early 1997) borrowing costs is 40 per cent compared with the cost of borrowing without access to infrastructure bonds.

2.3 Conclusion

State governments have accessed private finance for large economically justified urban road projects through BOOT schemes.

The cost of private financing — which will vary from case to case — is likely to be higher than for public financing. This difference has fallen over time as

¹⁸ There is an inverse relationship between the bond price and the bond yield.

the capital market for private investment in BOOT projects has matured. As well, *material adverse effect* (MAE) clauses have been used to mitigate the cost of risk.

Tax arrangements, such as the previous infrastructure bonds scheme and their replacement arrangements, allow the private sector to lower the cost at which they can access funds. Furthermore, some of the cost is borne by the Commonwealth Government in the form of reduced taxation revenue. However, the reduction to the cost of risk is associated with a loss of option value, possibly including future costs.

The extent of any difference between public and private investment is not publicly available for the BOOT schemes in operation. However, they may be offset by savings in design, construction and operation that flow from improved incentives provided by greater financial disciplines in the private sector. The nature and extent of these savings are discussed in Chapter 3. From a State perspective, there are also offsetting savings flowing from Commonwealth tax concessions.

3 ASSESSMENT OF BOOT SCHEMES

In this Chapter, the cost-effectiveness and equity of urban road BOOT schemes are assessed. Cost-effectiveness is a relative concept. Consequently, BOOT schemes are compared with public competitive tendering and contracting, the next best alternative approach.

The aim of the assessment is to identify whether BOOT schemes have an intrinsic advantage in the provision of roads. That is, advantages that cannot be achieved by other arrangements.

Urban road BOOT schemes are claimed to produce technical efficiencies in the development of urban road infrastructure. However, in particular circumstances, others argue they also impose costs. Consequently, the merits of using a BOOT scheme need to be assessed on a case-by-case basis.

3.1 Assessment of BOOT schemes by project stage

Generally, urban road BOOT schemes can be divided into three stages — planning and design, construction and operation. Planning and design involves the preparation of designs for an urban road facility while construction involves the co-ordination of building works. Operation mainly relates to maintenance and monitoring of infrastructure condition, setting appropriate toll levels and toll collection.

3.1.1 Planning and design

In most projects, planning and design is shared between the public and private sectors. The public sector usually prepares a preliminary design for a road facility and provides directives on the management of the project. Preliminary designs may specify a route, the number of lanes and the location of on and off-ramps. The private sector is usually left to complete the detailed design subject to government approval.

Road design

A key issue in road design is determining an effective trade-off between construction and maintenance costs. As the standard of road construction increases, construction costs increase and the level of maintenance required decreases because the road is able to better withstand wear and tear.

Determining an effective trade-off may be complicated because there is uncertainty over the level of wear and tear that a road will endure over its life. The two most significant factors leading to uncertainty are traffic volumes and adverse weather conditions.

Arrangements such as BOOT schemes can encourage an optimal trade-off between construction and maintenance costs because construction and maintenance is the responsibility of one agent. Consequently, the agent can minimise overall project costs by designing an appropriate trade-off between construction and maintenance costs.

Under a BOOT scheme, the private sector has an incentive to manage road design to secure the financial viability of a project. However, the NSW Audit Office argued that the drive to ensure the financial success of a project may introduce perverse incentives into the design stage:

... an urban toll road is not designed efficiently to meet the reasonable needs of the motorist but, at the public's expense, is designed to capture tolls (NSW Audit Office 1996, p. 4).

Design, construct and maintenance contracts can offer the same benefits as BOOT schemes and may also avoid perverse incentives in design. By bundling design, construct and maintenance into a single contract, the contractor has an incentive to minimise construction and maintenance costs. A contractor also has less of an incentive to manage road design in order to capture tolls because, under contracting out, government retains the financial risk of a project.

On the other hand, private BOOT scheme operators are subject to stronger commercial disciplines that strengthen the incentive to ensure that contractual cost variations are minimised. As EPAC noted:

[There is a] perception that the public sector has deeper pockets than thinly capitalised private firms and is thus potentially more tolerant of contractual non-performance (EPAC 1995a, p. 81).

Although this may be a significant advantage it is not solely to be found in BOOT schemes. Governments could employ private sector project managers under performance contracts to supervise the construction and operation contracts.

There is some evidence to suggest that BOOT schemes may result in designs being sub-optimal. For example, the construction of four proposed interchanges along the M5 has been deferred until the toll road is paid for to prevent traffic by-passing the toll plaza (NSW Auditor-General's Office 1994, p. 370). Similarly, the NSW Audit Office noted that:

... the Northern off-ramp onto the Hume Highway from the M5-West cannot be finalised because of the consequences to the owners of the M5-Central (NSW Audit Office 1994, p. 4).

The scope to influence design for the purpose of maximising toll revenue is limited by the project requirements specified by the government. For example, specification of the number and location of road on and off-ramps prevents BOOT operators from adopting revenue maximising features into their designs. However, governments may compromise on design specifications to secure private sector finance for a project.

Innovation

Under a BOOT scheme, private operators have an incentive to minimise overall project costs by requiring the private sector to trade-off design costs against operating costs. The private sector has a financial incentive to invest more resources into the design stage in order to develop innovative ways to minimise future operating costs.

Innovation may also be stimulated by the process involved in awarding the BOOT project. Competition for a contract can be a major driver of innovation. Contract bidders have an incentive to present innovative design solutions in order to improve the attractiveness of their bid.

However, the capital costs associated with BOOT schemes may discourage smaller operators from tendering for a project, tempering competitive pressures to innovate. Competitive tendering and contracting may provide an environment more conducive to innovation because it removes the need for a contractor to raise large sums of investment capital:

... the contracting out approach [to urban road projects] may open up competition to a wider set of parties than a BOOT-type arrangement. Under the BOOT approach, the need to assemble a consortium to mobilise large sums of finance can restrict the level of competition (EPAC 1995a, p. 82).

Providing the opportunity for smaller organisations to participate brings access to a wider knowledge base and increases the potential scope of introducing new ideas and new technologies.

Specifying a contract in terms of outcomes instead of processes can enhance the potential for innovation under CTC. Instructing designers to minimise overall costs and awarding contracts on the basis of the effectiveness of their proposals can give designers added incentive to innovate. The Industry Commission highlighted the example given by the Civil Contractor Federation (CCF) of how specifying contracts in terms of outcomes can encourage innovation:

A good example is the previously mentioned case from the CCF ... of the contracted provision of the Crystal Brook Bypass in South Australia, where a contractor submitted an alternative tender to design and build a steel bridge instead of a concrete one, with a cost saving of nine per cent (Industry Commission 1996, p. 144).

Specifying contracts in terms of outcomes may also go some way to alleviating the potential for contractors to take a short-term view in their designs. Design contractors do not incur the costs associated with operation of an urban road facility. Therefore, there is an incentive for them to increase profits by reducing the resources dedicated to design. Contracts that require design contractors to minimise overall project costs can militate against this.

However, regardless of the type of private sector involvement, government requirements may reduce the scope for innovation in design. Government directives on the timing of construction, the route to be taken and the standard to which a facility must be built restrict the private sector's ability to make cost trade offs. For this reason, the Victorian Government, in tendering for the City Link project:

... specified the project requirements in functional and performance terms, giving the private sector maximum scope for innovation in the development of project proposals (Auditor-General of Victoria 1996, p. 111).

Inadequate protection of intellectual property used in unsuccessful bids may also discourage design innovation. Concern over design concepts developed by an unsuccessful bidder being incorporated into the final contract may discourage innovative ideas being proposed. Further, EPAC noted that private firms were also concerned that:

... in the pre-tender evaluation process, government agencies sometimes engage in 'fishing trips' using the private sector as a free resource for consultancy advice (EPAC 1995a, p. 95).

In its report on *Competitive Tendering and Contracting Out by Public Sector Agencies*, the Industry Commission noted that the application of compensation payments may, in some cases, be appropriate. EPAC (1995) reached a similar conclusion.

3.1.2 Construction

The construction stage is characterised by a trade-off between construction time and construction cost. Devoting increased resources to construction reduces the time taken for completion but also increases the construction cost. Therefore, the overall cost of construction can be minimised by finding the optimal trade-off point between these two costs.

There are also financial incentives for timely completion of construction. Late completion delays the receipt of toll revenue.

BOOT schemes encourage operators to manage construction efficiently as they introduce a profit incentive into the construction cost trade-off. Operators can increase profits by minimising the capital cost of construction and maximising returns from the project by endeavouring to complete construction ahead of schedule.

There is evidence that BOOT schemes have facilitated the efficient management of construction. The M2 was completed six months ahead of schedule and made savings of around \$100 million on the Road and Traffic Authority's original estimate of \$556 million (Invest Australia 1997). Further, the Metal Trades Industry Association noted that:

The M4 Motorway in Sydney was completed nine months ahead of schedule and the Sydney M5 (and Western Link) motorway was completed in just two years compared to the scheduled four year construction program by the NSW Road Traffic Authority (MTIA quoted in EPAC 1995a, p. 81).

CTC has also proven effective in encouraging the completion of projects below cost and ahead of schedule. For example, contractors completed the Wangaratta Bypass more than eight months ahead of schedule, costing \$30 million less than the initial estimate of \$110 million (VicRoads 1993–94, pp. 16-7). Similarly, the Local Government Association of Queensland noted that Townsville City Council had saved 25 per cent of the cost of construction and maintenance of road shoulders throughout the city by aggregating the projects and contracting them out (Industry Commission 1996, p. 133).

CTC encourages efficient management of construction by opening road construction to competition. Contract bidders have an incentive to present tenders that minimise overall construction costs in order to win the contract. Including an appropriate balance of penalties and rewards (penalties for late completion and rewards for early completion) in contracts can strengthen the incentive to complete projects ahead of schedule.

During the construction phase, design changes, unforeseen geological and weather conditions, and the unavailability of materials and labour can cause delays and cost overruns. Construction cost risks can be particularly acute where tunnelling or major earthworks are involved because of unforeseen geological conditions.

Under Australian urban road BOOT schemes, the construction risk is borne by a construction contractor.¹ This is appropriate because the contractor is the best placed to control the risk. In this way, cost overruns or time delays are borne by the contractor rather than the BOOT operator.

The public sector may also assume some of the construction risks in order to attract private financing of a project (World Bank 1996, p. 11). One example of this is the arrangements for the Melbourne City Link project which provide for compensation of Transurban in the event of unidentified pollution or contamination of project land (Victorian Auditor-General's Office 1996, pp. 119–20).

A possible advantage of BOOT schemes is that once the contract is signed, the government is committed to the project. This minimises the potential for unwarranted political interference because the cost of varying the contract must be explicitly considered.

3.1.3 Operation

Once an urban road has been constructed, there remain many issues in relation to how the facility should be maintained and operated.

Maintenance

Urban road operation involves striking 'an appropriate balance between economy in the organisation of maintenance work, and availability and quality of infrastructure services offered to users' (Mills 1993, p. 10). A high level of maintenance may prevent road deterioration but may also increase operating costs and cause traffic delays. Conversely, inadequate maintenance levels that cause road quality to deteriorate may result in low road usage levels.

BOOT arrangements encourage an appropriate level of maintenance by introducing financial incentives into the trade-off decision. BOOT operators carry the financing risk of the project. Therefore, operators have an incentive to ensure that a facility operates in a way that maximises returns.

Deteriorating road quality can have a detrimental effect upon the financial viability of a BOOT project. As road quality declines, vehicle operators may switch to better maintained roads, reducing the revenues earned by the BOOT operator. Conversely, unnecessarily high maintenance levels increase

¹ For example, the construction of the M2 was separately contracted out (EPAC 1995a). Similarly, Interlink contracted construction of the M5 to Leighton Contractors Pty Ltd (NSW Auditor-General's Office 1994, p. 380).

operating costs and may also result in traffic delays due to frequent lane closures. Traffic delays may cause traffic to divert to alternative routes and reduce operating revenues.

CTC can also offer the same benefits as BOOT schemes. Competition for tenders can encourage maintenance suppliers to offer the best trade-off between maintenance standards and maintenance costs with minimal disruption to traffic flow.

In the case of a toll road, an efficient trade-off between maintenance costs and road quality may also be obtained by bundling maintenance and operation into a single contract. Contracting both functions to a single party requires the contractor to co-ordinate maintenance with operation so as to maintain road quality while minimising disruptions to traffic flow.

However, contracts need to be appropriately specified. Contractor behaviour must also be effectively monitored to avoid principal-agent problems of incompatible incentives. The requirements that may be specified in a contract include maintenance and service standards, the timing of routine maintenance and penalties for failure to meet contract conditions.

A potential disadvantage of BOOT schemes is that the incentive to provide an adequate level of maintenance may decline toward the end of the concession period:

... the eventual transfer of the assets to government can provide limited incentive for the private sector to undertake maintenance of these assets towards the end of the concession period. This is usually handled by specifying the standard or quality of asset required at the transfer (EPAC 1995a, p. 84).

To minimise the possibility that maintenance standards may decline toward the end of the concession period, BOOT arrangements generally specify the standard of asset required at the point of transfer to the government. For example, the arrangements for the City Link project detail the condition required when ownership of the facility reverts to the State at the end of the concession period:

In essence, the major components of the Link must be in a condition which reflect a remaining operational life equal to the following:

- bridges and tunnels — 80 years;
- road pavement — average of 20 years;
- road surfacing — average of 5 years;
- major electrical and mechanical equipment — a minimum of 20 years;

- communications and control systems and equipment — 10 years; and
- renewable items — not less than 50 per cent of the operational life (Victorian Auditor-General's Office 1996, p. 135).

Tolls

The construction and operation of a BOOT project is ultimately financed from tolls collected over the concession period. Each of the roads developed under a BOOT scheme in Australia have, or will have, tolls imposed.

Under an assumption of profit maximisation, BOOT operators have an incentive to set a toll that will maximise revenue. This will be largely determined by what they expect the motorist is willing to pay for the enhanced service provided by the toll road.

However, in certain circumstances, BOOT operators may possess market power and therefore, may be able to earn above normal profits. A BOOT operator may possess market power for a number of reasons. First, geographical uniqueness means that no two roads are perfectly substitutable as motorists incur some form of cost, such as extra driving time, by switching between routes. Second, BOOT roads generally offer the motorist freeway conditions, providing the motorist with time savings and driving conditions superior to those offered by local roads. This effect may be enhanced by traffic calming measures that prevent or slow traffic flow on roads surrounding the BOOT facility. Third, MAE clauses that prevent governments from building competing roads with a BOOT facility, effectively create a barrier to potentially more efficient operators competing with the BOOT operators.

Governments can limit market power by regulating tolls. The NRMA noted in discussions with the Commission that there is a community mind set against tolls. Consequently, governments may also use regulation to ensure that toll levels remain at acceptable levels.

The trade-off between the private sector's desire to maximise revenues and the government's desire to ensure tolls remain at acceptable levels contributes to the length of the concession period.² The lower the level of the toll, the longer is the time required to recover the capital cost of the project.

The most common form of tolling regulation employed in Australia links maximum toll rates with movements in the CPI. Tolling arrangements used on Australian BOOT projects are outlined in Appendix A.

² Other factors that may influence the length of the concession period include the capital cost of the project, expected traffic volumes and expected economic conditions.

Regulating toll rates reduces the flexibility with which tolls can be adjusted to effectively manage the demand for a road. Moreover, the World Bank argued that toll regulation may increase revenue risks:

Regulating toll rates increases the revenue risk of toll road projects, however, because revenues at or below the maximum rate may be substantially lower or higher than expected, with limited flexibility for adjustment. If traffic is lower than expected, rates cannot be adjusted upward to their optimal profit maximising level. If traffic is higher than expected, the government cannot limit the concessionaire's returns by lowering toll rates (World Bank 1996, p. 24).

The arrangements for the City Link project provide for Transurban to reimburse the State where tolling revenues exceed financial projections agreed with the State. This arrangement seeks to ensure that the State benefits from any higher than expected profits earned by Transurban (Victorian Auditor-General's Office 1996, p. 131). Profit-sharing arrangements can maintain the operator's incentive to perform once revenues have reached the ceiling (World Bank 1996, p. 24).

Toll collection costs

The transactions costs associated with both manual and electronic tolling can be significant. Manual tolling requires the construction of toll booths and extra lanes on the approach and retreat from the toll booths to keep traffic flowing. Manual tolling can also impose costs from queuing and stopping to pay tolls. These costs can become quite significant during peak periods.

Electronic tolling avoids some of the costs associated with manual tolling but incurs others. Electronic tolling eliminates toll plazas and therefore avoids queuing and stopping and the need to build extra lanes. The Queensland Department of Main Roads noted that:

A dedicated electronic toll collection lane has an estimated capacity of around 1000 vehicles per hour as compared with 400 vehicles per hour with a combined swipe card and cash payment lane (Queensland Department of Main Roads 1996).

On the other hand, electronic tolling incurs enforcement costs associated with non-payment of tolls. For example, the City Link developers have found it necessary to install video surveillance cameras that will record an image of the number plate of vehicles not carrying a Transponder. If the user has not purchased a Day Pass for the facility, the registration details of the vehicle will be supplied to VicRoads which may fine the motorist. Manual tolling avoids these costs as motorists cannot use the road without encountering a toll booth.

Regardless of the tolling method employed, all toll roads require careful planning and design to ensure the viability of the toll system. A toll road that has too many entry and exit points may allow motorists to manage their use of the facility around tolling points. For example, the toll plaza on the M4 was originally located on the Western Section, but this was not considered financially viable by the project's financiers (NSW Auditor-General's Office 1994, p. 358). Subsequently, the toll plaza was relocated to the Eastern Section between James Ruse Drive and Silverwater Rd (see Appendix A).

The NRMA noted in discussions with the Commission that the need to maximise toll collections can result in inefficient user charging. Toll booths located in the middle of the tollway may maximise toll collections but may also result in the charge no longer reflecting distance travelled and, therefore, road use costs.

The location of toll booths may also result in inequities. The NSW Auditor-General's Office noted the inconsistency in tolling along the M4:

Motorists on the Eastern Section receive a small marginal benefit (a 33 per cent increase in road capacity for a length of 2.5 kilometres). In exchange they are the sole providers of toll revenues which service and repay the capital cost of constructing the entire 12.1 kilometre length of the Eastern and Western Sections. Although it is understood that some 60 per cent of Eastern Section users also have travelled on the Western Section, they do not pay for travelling that section ... Motorists on the Western Section benefit from a 10 kilometre length of privately funded roadway ... They bear no cost for travelling this section of the project road (NSW Auditor-General's Office 1994, p. 358).

Tolling collection systems need to be consistent between toll roads within the same city and across cities. Consistency in tolling methods minimises transactions costs and avoids the inconvenience created by having to deal with different systems.

Currently, there is little consistency in the tolling technology employed on toll roads in Australia — Sydney alone has three different types of tollway technology. AUSTRROADS and Intelligent Transport Systems Australia (developers of electronic tolling systems) are currently preparing a draft national standard for electronic toll collection to improve the uniformity of tolling mechanisms in Australia. When developed, the draft standard and associated framework will form the basis for future implementation of electronic tolling systems.

Electronic tolling raises the need to ensure that appropriate privacy safeguards are in place to prevent the misuse of information collected from private toll road users. Electronic tolling may invade an individual's privacy where the operator has access to registration details of motorists in order to issue fines for

non-payment of tolls. The arrangements for the Melbourne City Link overcome this problem by giving VicRoads the responsibility for issuing infringement notices.

Integrity in the use of personal details may have a significant impact upon the success of a BOOT project. Failure to adequately ensure privacy may dissuade motorists from using a facility. Adequate privacy provisions may also go some way to increasing community acceptance of electronic road tolling in general.

Toll collection, which is generally a requirement of BOOT schemes, imposes costs that are not incurred when roads are un-tolled. These costs should be taken into account when assessing the relative merits of toll roads.

3.2 Equity considerations

BOOT schemes have equity implications. BOOT operators only capture benefits of the road (through tolls) accruing to users, however, they are unable to capture the benefits flowing to others. In addition, tolling can result in inter-generational inequities as current users pay for a road which will benefit future generations.

Urban road BOOT projects typically have concession periods of thirty years or more. This poses inter-generational equity issues because the investment decision commits future generations of road users to pay for the infrastructure through tolls.

Long-term government debt may give rise to similar concerns. However, unlike tolls, general debt does not impact on particular individuals within the community.

BOOT arrangements may not equitably distribute the cost burden of the project between generations. Assuming tolls are removed at the end of the concession period, motorists who use the toll road during the concession period pay a higher cost for that use than motorists using the road after the concession period concludes. This may be inequitable since future motorists still receive some benefit from the facility.

On the other hand, future generations receive a road that has suffered wear and tear. Therefore, front loading of charges may be appropriate as the current generation have access to a much higher quality of road.

Further, BOOT roads are generally constructed to a capacity suitable for carrying traffic volumes expected toward the end of the road's life. Current motorists face the full cost of building this excess capacity if tolls are removed at the end of the concession period.

Finally, the development of road infrastructure may benefit members of the community who are not required to meet the costs of road construction. A new road may result in increased land values due to lower traffic in residential areas and increased business activity. However, those who benefit from these effects do not contribute to road construction costs — the burden falls solely to road users.

Currently, there are no mechanisms in place for BOOT operators to successfully capture all the benefits extending from their decision to invest in road infrastructure. In many cases, any attempt to directly capture these benefits may be difficult to apply because cause and effect may be difficult to disentangle. For example, property values may be influenced by factors other than road infrastructure such as general market conditions, provision of other infrastructure and growth of the city.

3.3 Conclusion

The relative merits of using BOOT schemes for urban road development must be assessed on a case-by-case basis. However, BOOT schemes can offer more cost effective urban road development because of the stronger financial incentives on the provider. BOOT schemes can also benefit the community through innovative design and construction techniques. However, these advantages are not solely found in BOOT schemes — they may potentially be accessed with publicly provided roads.

In certain circumstances, BOOT schemes can impose efficiency costs related to tolling and there are intergenerational equity concerns.

4 ASSESSMENT AGAINST GOVERNMENT OBJECTIVES

In this Chapter, the cost effectiveness of BOOT schemes for providing urban roads is assessed against key State government objectives for private provision of infrastructure. The common objectives of encouraging private participation in the provision of urban roads are identified and used as criteria to assess the effectiveness of BOOT road schemes.

The comments in this Chapter are not intended to apply to infrastructure projects in general.

The effectiveness of urban road BOOT schemes for achieving widely accepted objectives is assessed. There are a range of objectives that have been advanced by governments for the encouragement of private investment in infrastructure. For the purpose of this study, key objectives common to NSW and Victorian guidelines have been used as the basis of the assessment.

4.1 Government guidelines

Five States, NSW (1995), Victoria (1994), Queensland (1992), South Australia (1994), and Western Australia (1992) have published guidelines or policy statements for private sector involvement in the provision of infrastructure. The guidelines are not road specific, nor do they all relate only to BOOT arrangements. They canvas a range of private sector involvement for both social and economic infrastructure.

Each State's guidelines has the stated broad objective of encouraging private involvement in the provision of infrastructure. The specific objectives of the various guidelines vary but, in general, are to supplement the State's existing stock of infrastructure, provide additional infrastructure efficiently (that is, at minimum cost) and to promote economic activity and economic development. The guidelines also outline the process by which private sector proposals will be initiated and assessed. Queensland and Western Australia are in the process of redrafting their guidelines.

Objectives and principles

The Victorian guidelines present a statement of objectives and guiding principles. The Victorian government states that its aims in seeking private involvement in the provision of infrastructure are to:

- procure assets, goods and services in the most efficient, cost-effective and timely manner;
- take advantage of new technologies and innovations, private sector management skills and a wide range of financing techniques;
- promote the growth of new and existing Victorian businesses and employment; and
- strengthen the State's economy, producing sustainable social, cultural or other quality of life benefits.

The Victorian guidelines also outline a range of guiding principles the government intends to follow in seeking private sector investment. These include:

- providing scope for the private sector to apply specialist skills, management processes and innovation;
- allocating risk to those best able to assess and manage it;
- maintaining flexibility to meet changing circumstances by avoiding long term inflexible undertakings;
- encouraging private involvement which results in lower costs to government (commensurate with the allocation of risks); and
- securing private participation through competitive bidding wherever possible.

The identification of objectives and principles in the NSW guidelines is more difficult as they must be gathered from the discussion in various parts of the guidelines. In discussing the scope of private involvement in public infrastructure, the NSW government indicates that:

The Government aims to maximise private investment in infrastructure to the extent that this means of provision results in net benefits to the community beyond those from public provision.

It also strives to promote an efficient allocation of risk between the public and private sectors to parties best able to manage them (NSW 1995, Sheet 1 (I)).

In the overview of the process of involving the private sector, the government's policy is that projects must be consistent with the agency's Asset Strategic Plan and that a competitive bidding process will apply in all cases, unless otherwise agreed to by the Budget Committee of Cabinet. The

guidelines further indicate that the government's preference is for financially free standing projects without need of government support and maximum Australian and New Zealand industry participation is to be encouraged in any projects. The NSW government also indicates that it will consider contributing to projects in order to maximise the benefits accruing to the community.

Further insight into the objectives of the NSW guidelines is provided by the NSW Treasurer's foreword to the document. The Treasurer states that the NSW government through its guidelines:

... aims to ensure clarity and transparency in dealing with the private sector. The Government is interested in exploring alternative methods for, and innovative solutions to, the creation of infrastructure ... (NSW 1995, p.1).

An important difference exists between the NSW and Victorian guidelines. The Victorian guidelines appear to be based on a presumption in favour of private involvement. The NSW guidelines appear to be more objective and require an evaluation of the relative merits of private and public provision on a case-by-case basis.

4.2 Assessment

The key objectives common to the NSW and Victorian guidelines identified fall under the headings of efficiency, cost-effectiveness and transparency. The extent to which BOOT provision of urban roads meets effectiveness and cost-effectiveness objectives for private involvement is assessed under three broad headings, *risk and uncertainty*, *competition* and *innovation*.¹

The NSW guidelines stress the importance of *transparency* in the process of involving the private sector. The Victorian guidelines do not emphasise transparency explicitly. However, both the Victorian and NSW experience with BOOT schemes for urban roads will be assessed according to the degree of transparency in the arrangements.

Risk

The NSW and Victorian guidelines provide direction on the allocation of risks in BOOT projects for the private provision of public infrastructure. For

¹ The guidelines specify a range of other objectives for private involvement in the provision of public infrastructure. However, BOOT projects for roads are not assessed against these other objectives which vary considerably between States.

example, the Victorian guidelines state that one of the guiding principles of the Victorian government is to:

... allocate risk to those parties which the Government considers best positioned to assess and manage it (Victoria 1994, p. 2).

Similarly, the NSW guidelines state that the Government:

... strives to promote an efficient allocation of risk between the public and private sectors to parties best able to manage them (NSW 1995, Sheet 1, (I)).

However, achieving the objective that risks are allocated to those best able to assess and control them is not a straight forward matter when considering BOOT provision of urban roads. Three areas of difficulty arise — how risks and uncertainty are managed, the use of stand-alone companies for BOOT road projects and network issues.

Risk allocation

Both NSW and Victoria desire to allocate risk to those best able to manage it. However, the guidelines give only general guidance as to what is meant by risk management and how it is to be allocated. For example, the Victorian guidelines state that:

The Government will consider mechanisms for sharing and minimising risks. However, the risks associated with design, construction, financing and operation of an asset will generally be borne by the private sector (Victoria 1994, p.6).

Government objectives deal with the allocation of risks but do not differentiate between risk and uncertainty. The problem of uncertainty has been implicitly recognised by State governments for BOOT road projects. Governments have attempted to mitigate uncertainty by the inclusion of material adverse effects (MAE) clauses in many of the contracts for private roads.

However, MAE clauses may impose costs on the community in terms of restrictions on the future development of the road network and public transport, restrictions on future land use and changes to existing traffic arrangements. This is particularly the case with roads where the private operator is granted a long concession to operate the road. The MAE clauses may impact on the actions of governments decades into the future.

State governments are clearly taking actions, through MAE clauses, to deal with uncertainty. However, the guidelines do not offer a framework for identification and mitigation of uncertainty.

Stand-alone companies

BOOT schemes for urban roads in NSW and Victoria have been provided through stand-alone companies created to build and operate a specific project. These arrangements appear inconsistent with the appropriate arrangements for bearing risk.

Stand-alone companies for BOOT schemes are typically formed by a joint venture between two or more other entities.² The only activity of the stand-alone company is the building and operation of the toll road. The implication is that the success or otherwise of the company is dependant on the profitability of the toll road. The BOOT consortium has forgone the possibility of pooling the risk of operating the toll road with the risks of the other projects undertaken by the parent companies.

However, from the parent company's viewpoint they are pooling risk if they have investments in other similar infrastructure projects. The pooling of risk in road projects is difficult because of the small number of BOOT road projects which have been undertaken in Australia. As a consequence, non-recourse financing has been a feature thus far of urban road BOOT schemes.

The limited ability of BOOT road companies to spread and pool risk, given the nature of the company structure used to provide these projects, does not appear to be consistent the State government's desire to allocate risk appropriately and provide infrastructure most efficiently.

Network issues

Urban road BOOT schemes introduce a tolled road into a larger urban road network that is not directly priced. The existence of the network provides the opportunity for the motorist to avoid the toll by choosing to use un-tolled alternative routes. For example, in its economic assessment of the City Link project, the Inter-Departmental Committee Working Group argued that:

... if tolling [on the City Link] was introduced, diversion would occur of traffic into the surrounding road network, estimated to be approximately 40 per cent of anticipated traffic volumes ... this was considered contrary to the objective of attracting through traffic onto the Links ... (Victorian Auditor-General's Office 1996, p. 104)

The financial viability of a BOOT project may also be jeopardised by government decisions on the surrounding transport network. Government

² For example, the Transurban consortium which is currently building the Melbourne City Link project is a joint venture comprising Transfield Construction Pty Ltd and the Obayashi Corporation.

decisions that result in the construction of a competitive un-tolled road or the development of subsidised competitive public transport can undermine the revenues earned from the BOOT road.

In consequence, BOOT operators have attempted to secure the financial viability of road projects through a number of methods. In some cases, the government has underwritten the revenue stream earned from a BOOT road. For example, under the arrangements for the Sydney Harbour Tunnel, the NSW Government will make good any revenue losses sustained by the operators. Consequently, revenues could double or halve with no consequence to the operators of the Tunnel but with significant consequences for the NSW Government (NSW Audit Office 1996, p. 5).

However, arrangements such as those employed in the Sydney Harbour Tunnel project adversely affect the incentives to operate the facility efficiently. If revenue losses caused by poor operation of a facility are not sustained by the private operator, the operator has no incentive to ensure the facility functions well. For example, under the Sydney Harbour Tunnel arrangements, Mills argued that:

Because actual tunnel receipts do not affect the company's gross revenue, the situation appears to provide an incentive to the company to pitch the level of expenditure on the breakdown service at a level below that which would be optimal in a case of conventional profit-maximisation, and hence (probably) below that level which would maximise welfare. ... There could be a similar incentive to curtail maintenance expenditure (Mills 1991, p. 287).

BOOT arrangements negotiated since the Sydney Harbour Tunnel project have dealt with uncertainty more effectively. For example, prior to the introduction of the cashback scheme, the developers of the M4 carried the majority of the risks associated with the project including the risk that the actual cost of the project is greater than the estimated cost and the actual revenue of the project is less than the estimated revenue (NSW Auditor-General's Office 1994, p. 359).³

Project developers, however, still require some form of guarantee from the government that adverse policy decisions will be duly compensated. MAEs allow for the compensation of BOOT operators for the impacts upon their revenue from adverse government policy decisions. Compensation may constitute a cash rebate to the developer, an extended concession period or allow changes in tolling policy.

³ See Appendix A for further details.

Shadow tolling may prevent traffic diversionary effects because the BOOT road is no longer directly tolled.⁴ Consequently, motorists would not attempt to avoid the toll by using alternative routes resulting in a reduction in traffic on the surrounding road network.

The economic assessment of the City Link proposal identified two other advantages of shadow tolling:

- No toll plaza or collection systems would be required, resulting in reduced travel time and lower capital and operating costs; and
- Cost sharing would be achieved for both users and other beneficiaries such as industry, local communities and the wider Melbourne and Victorian community, as the toll was not directed to motorists alone (Victorian Auditor-General's Office 1996, p. 104).

However, shadow tolling is not a direct cost to the motorist and therefore the toll would not play a direct part in the motorist's decision about when and where to travel.

Competition

The NSW and Victorian guidelines outline a detailed process for evaluating proposals from the private sector. The objective being to maximise the degree of competition amongst possible private sector road builders and operators. The process includes calling for registrations of capability, short listing proposals, calling for detailed proposals, evaluation of proposals, recommending the preferred consortium, and negotiation with the preferred proponent leading to the signing of contracts.

Several issues arise in relation to the effectiveness of competition among private bidders for the provision of urban roads through BOOT schemes:

- project size;
- number of short listed proposals; and
- incidence of direct negotiation.

Each of these issues have the potential to limit competitive pressures in the bidding process and hence limit the opportunity to achieve many of the advantages claimed for BOOT provision of urban roads.

⁴ Shadow tolling is where the government provides the private sector with a specific annual payment per vehicle using the road. The government may raise the necessary finance through indirect charges such as registration fees.

Project size

Urban road projects provided by BOOT schemes tend to be very large in terms of project cost and resources needed to complete the project. This reflects, at least in part, the nature of BOOT projects in bundling design, construction and operation of the road into a single project. For example, the Melbourne City Link project is estimated to cost approximately \$1.8 billion.

The size of BOOT schemes for urban roads means that only a limited number of companies may be able to undertake such large projects. This has implications for the degree of competition in the bidding process. A possible benefit is the creation of a small pool of firms with specialist skills in the provision of BOOT schemes for urban roads. If there is effective competition between these firms government may reap benefits from specialisation.

However, there is also the possibility that limiting the pool of possible bidders may weaken competition in the bidding process. For example, the companies comprising the Transurban consortium have also been involved in the provision of the Sydney Harbour Tunnel and the M2 Motorway in Sydney. The size of urban road BOOT schemes may limit the number of projects consortium members could undertake at any one time. This may lead to an implicit sharing of projects between the key bidders in order to maintain a manageable number of in-progress projects.

A small number of possible players also increases the possibility of explicit collusion in the bidding process. This may take several forms, all of which seriously undermine the competitive bidding process. Firms may explicitly decide to share projects by agreeing to submit higher bids than the firm who is to win a particular contract. Alternatively, the existing group of firms may collude to prevent the entry of a new player into the BOOT road industry.

Number of short-listed proposals

State government guidelines attempt to directly influence the effectiveness of competition in the bidding process through the number of short listed proposals and the number of bidders included in the negotiation stage.

Both the NSW and Victorian guidelines indicate that, in most circumstances, several proponents will be short-listed on the basis of initial expressions of interest.⁵ These firms would then be invited to prepare more detailed proposals for consideration by the evaluation panel. For example, the NSW guidelines indicate that:

⁵ Direct negotiation with a single private proponent may be authorised both in NSW and Victoria under certain circumstances. This issue is discussed under the next section.

... the Committee's evaluation would normally lead to a short-list of up to three proponents from whom detailed proposals could be invited (NSW 1995, Sheet 4, (IV)).

Competition is likely to increase with the number of bidders to be included on the short-list. However, there are costs involved in the preparation of bids by the private sector and costs involved in the evaluation of them. These costs are likely to be especially large for road projects given the size and complexity of the projects. For this reason the Victorian guidelines indicate a flexible approach will be taken to the number short-listed. The Victorian guidelines state that:

For projects where bidding costs are unavoidably high, the Management Panel will have particular regard to the cost of preparing submissions when determining the number of organisations to be included in the short list (Victoria 1994, p.12).

Once the proposals of the short listed firms are considered, the preferred bidder is usually nominated. The nomination of a preferred bidder confers a substantial advantage on that proponent relative to the other short-listed candidates who have submitted satisfactory proposals. In order to maintain competitive pressure on the preferred bidder, there is merit in keeping other bidders in reserve should negotiations with the preferred bidder fail.

Competitive pressures are further increased the longer bidders are kept active in the process with the possibility of winning the contract to complete the project. This possibility is explicitly allowed for in Victorian guidelines which indicate that:

On some projects the Government may wish to continue negotiations with more than one proponent (Victoria 1994, p.13).

However, this can be a costly process for both the government and the private sector, especially in the case of road projects. The private proponents may be reluctant to incur excessive costs by participating in protracted negotiations.

In addition, given the relatively small number of possible bidding firms, some firms may be concerned that engaging in protracted negotiations may impinge on their ability to bid on other projects. They may therefore choose not to participate in the detailed negotiation stage, or do so with a reduced level of commitment.

One option for the government to overcome this reluctance is to compensate the private bidder for all, or part, of their costs. The costs involved for road projects may be substantial. However, neither guidelines discuss whether compensation would be considered for losing bidders when negotiations continue with several proponents.

Direct negotiation

In cases where the project is initiated by the private sector, both NSW and Victorian guidelines permit the government to enter into direct negotiations with the private firm proposing the project.⁶ The government may do this without seeking other bids. This is to overcome private sector reluctance to suggest projects if there is a possibility that the proposing firm may not be awarded the final contract.

Guidelines establish strict controls on the ability of agencies to enter into direct negotiations without a tendering process. For example, direct negotiation must be approved by the Budget Committee of Cabinet in NSW. This is appropriate because direct negotiation could stifle the benefits which may have been available if the project (or parts of the project) had been subject to competitive tender.

The Victorian guidelines also place effective restrictions on the direct negotiation path. The guidelines indicate that:

... the direct nomination path will only lead to direct appointment of an organisation as the preferred developer where the private sector proponent has offered Government a proposal which embodies a unique and proprietary concept as an essential component of the proposal and where the proposal is cost competitive when measured against the Government's benchmarks (Victoria 1994, p.8).

The imposition of strict controls on direct negotiation is particularly appropriate for the provision of urban road projects. This is because the concession periods awarded to the operators of urban roads are typically decades long.

If the direct negotiations lead to an outcome which is less satisfactory than that which would have been achieved through a competitive bidding process, the government and community may bear the disadvantage for decades. Such disadvantages may be manifested as higher tolls, poorer design, construction and operation of the road and/or longer concession periods.

Innovation

The NSW and Victorian guidelines emphasise the role of the private sector in bringing innovative solutions and ideas to infrastructure problems. Innovation

⁶ The only privately proposed BOOT project completed to date is the Sydney Harbour Tunnel. This project was commenced prior to the NSW government's first issuing of 'Guidelines for Private Sector Participation in Infrastructure Provision' in 1988.

is possible in two broad areas: technical innovation in project design and construction; and financial innovation in funding projects.

Technical innovation

The NSW and Victorian governments aim to encourage technical innovation in project design and construction by avoiding specifying the project too tightly. Emphasis in their guidelines is on outlining the outcomes desired from the project rather than specifying detailed plans and construction methods. For example, the NSW guidelines indicate that:

... the objectives of the proposal to be expressed in terms of essential output specifications and performance based requirements, without identifying specific solutions (NSW 1995, Sheet 4, (I)).

In a similar approach the Victorian guidelines indicate that:

... the Government will seek to specify its requirements in terms which allow the private sector maximum scope for competitive innovation and enterprise in meeting the end need of the community or consumers concerned (Victoria 1994, p. 4).

In government initiated projects, the scope for the private sector innovation will depend upon the degree to which the project detail is specified by the public sector.

However, in practice the scope for private sector innovation for urban road projects is limited because the road is usually pre-specified. For example, the project brief for the southern and western bypasses in Melbourne (the City Link project) specified two options for part of the western link. Private bidders could nominate which option to include in their bids. This provided limited opportunity for private innovation.

Financial innovation

The Victorian guidelines in particular specify that an aim of encouraging private involvement in the provision of infrastructure is to access '... a wide range of financing techniques' (Victoria 1994, p. 2). However, it is unclear whether innovative financing is meant to result in the project being completed at minimum cost or to take full advantage of taxation concessions.

The distinction between overall project cost and the cost borne by the private investors depends on the ability to shift costs to other parties. For example, the use of infrastructure bonds transfers some of the cost of the project onto the Commonwealth Government in the form of forgone taxation revenue. The total cost of the road may be unchanged but the cost to the private consortium and possibly road users is reduced.

Such cost shifting may be appropriate where, for example, the Commonwealth government wishes to encourage private investment in infrastructure projects. Several of the existing BOOT projects for urban roads have made use of the Commonwealth government's infrastructure bond program.

Innovative financing arrangements may, however, increase the total cost of the road project. This may occur, for example, due to excessive transactions costs in arranging project finance. Time and resources may be devoted to 'innovative financing' which is aimed at shifting the financing cost of the project from the private investors to other parties, including the Commonwealth. Total project cost is increased but the share borne by the private investors is reduced.

Transparency

The NSW guidelines, in contrast to those issued by the Victorian Government, place some emphasis on transparency and disclosure issues.⁷ However, the NSW guidelines are more concerned with disclosure once arrangements have been finalised rather than transparency throughout the process.

The NSW guidelines (1995, Sheet 7 (I)) require summaries of completed contracts to be prepared by the Auditor-General and tabled in Parliament within 90 days of contract signing (or within three sitting days of the next sitting of Parliament). Although this requirement is to be supported, consumer groups, in discussions with Commission staff, have expressed concern that this process simply reports signed contracts when it is too late for the community to have any effective input.

In addition to contract summaries, the NSW guidelines (1995, Sheet 7 (III)) specify that the agency (which initiated the project) undertake a 'post implementation review' to be initiated 12 months after the physical completion of the project. A copy of the review is to be made available to the NSW Treasury. The guidelines do not indicate whether the report is to be made public.

Although NSW places some emphasis on transparency when involving the private sector in the provision of infrastructure, most of the information available on projects is only public once contracts have been signed. In the

⁷ The Victorian guidelines require the agency responsible for the project to prepare a contract summary for the responsible minister and the Treasurer. This forms the basis of a submission to Cabinet confirming that the project complies with conditions set by the Government. There is no indication that this summary is to be made public.

case of Victoria, although not required under the guidelines, all contracts and agreements relating to the Melbourne City Link project are publicly available.

The lack of transparency in the early stages is particularly unsatisfactory for urban road projects for several reasons. Public participation in the initial design and planning stage is crucial for a road project. Public input is especially important for road projects because there is a distinct lack of a market for new roads in which the demands of users can be readily identified. There are no road prices which can indicate to governments where new investments in roads should take place and what priority should be given to various projects.

Consequently, it is essential that road users and the community are able to provide input into plans for new roads. However, the confidentiality requirements enforced during the bidding process for BOOT roads may limit the scope for public participation.

The lack of transparency prior to the signing of contracts is a further problem for road projects because of the long concession periods involved. The public may have little or no knowledge of the contract provisions until they are signed. It is possible that the community may find that the contract contains, for example, unacceptably tight restrictions on future developments in the road network over many years. However, the contract has been signed and changes may not be possible.

The public release of such a report would increase the degree of transparency in BOOT arrangements. Such a review would provide the public with information not covered in the original contract (or contract summary). For example, it would include any changes to the project once the contract had been signed and the extent to which timetables had been met.

In addition, a post implementation review would provide a valuable learning process for both the public and private sector. This would be particularly valuable in the case of road projects because, to date, so few have been undertaken. It would have the potential to reduce the transactions costs involved in future projects through the dissemination of the experiences gained on each project to a wider audience. There is no evidence that such a review has been completed for any of the existing BOOT road projects.

More fundamentally, public justification has not always been provided in terms of the relative costs and benefits for the decision to use private rather than public finance. It is the economic and financial assessments that make the preceding decision making process transparent. Without this information, the Commission and others are not in a position to judge the benefits and costs of a BOOT scheme relative to CTC under public ownership.

4.3 Conclusion

Five States have published guidelines, or policy statements, for private involvement in the provision of public infrastructure. None are road specific, nor do they relate specifically to BOOT schemes.

Overall, BOOT schemes for urban roads seem to have had limited success in achieving the State's objectives for private sector involvement in the provision of infrastructure. However, it is difficult to generalise and each case must be considered on its merits.

There are significant risks and uncertainties associated with BOOT projects for urban roads. It is not clear that current arrangements have appropriately allocated risks between the public and private sector. The limited number of firms able to participate in urban road BOOT schemes may jeopardise competition in the bidding process. And there is only limited scope for technical innovation in road design and construction. In combination, these factors imply that BOOT schemes may be less likely to meet governments' own objectives for private sector involvement in the provision of infrastructure than private provision of other forms of infrastructure.

Transparency is poor in the stages leading up to the signing of contracts with the BOOT consortium. This severely limits the opportunities for public participation and comment in the early stages of the project. And public participation is especially important in the case of roads where there is no explicit market in which to ascertain consumer demands.

Each urban road project is unique. At the very least, governments should provide a case-by-case assessment of the benefits (and costs) of each BOOT scheme against the alternative of public sector financing and contracting out. This should include information on the assessment of risk and the identification of uncertainty. The appropriateness of the measures to mitigate risk and uncertainty should also be evaluated, including the identification of any contingent public liability.

However, this is not to imply that private involvement in other forms of public infrastructure is not more successful in meeting State government objectives.

A AUSTRALIAN URBAN ROAD BOOT SCHEMES

There are five BOOT urban road projects in Australia. Four of these — Sydney Harbour Tunnel, M4, M5 and M2 — are currently in operation in Sydney while the fifth — City Link — is under construction in Melbourne.

The arrangements for each of these projects is outlined in this Appendix. The infrastructure and history of the project is described and the financial and risk allocation arrangements are outlined.

A.1 Sydney Harbour Tunnel

The Sydney Harbour Tunnel provides a four lane carriageway extending 2.3 kilometres between the Warringah Freeway, north of Sydney Harbour and the Cahill Expressway, south of the Harbour. Construction began in 1988 and finished in August 1992. The developers have a concession to operate the facility until 2022 when ownership reverts to the NSW Government.

Construction of the tunnel was carried out by a joint venture comprising Kumagai Gumi Co Ltd and Transfield Pty Ltd under the auspices of the Sydney Harbour Tunnel Company Limited (hereafter Tunnel Company), a subsidiary of the Kumagai and Transfield groups.

Project history

Proposals for a second Harbour crossing first surfaced in the early 1980s when the Road and Traffic Authority (RTA) (then the Department of Main Roads) put several schemes on public display. These schemes, mostly for new bridges and mostly at some distance from the Harbour Bridge, attracted opposition from local communities who would have to bear a major new traffic route through their area (Mills 1991, p. 280).

Public opposition along with the estimated costs of the schemes seemed to quell interest in the proposals. Then, in 1986, the NSW government announced that a private consortium was to undertake the construction of a tunnel under Sydney Harbour. It seems that the private company approached the Government with the proposal.

Travers Morgan Pty Ltd¹ and the Department of Environment and Planning argued that a tunnel crossing was not economically justified. Travers Morgan stated that:

None of the options considered is currently economically warranted, nor is it likely to be for several years. The NPVs [Net Present Values] of immediate construction average around \$-250 million (Travers Morgan quoted in NSW Auditor-General's Office 1994, p. 257).

The Department of Environment and Planning argued that the project had:

... technical deficiencies or contradictions, which when summed lead to doubtful conclusions in support of the project (The Department of Environment and Planning quoted in NSW Auditor General's Office 1994, p. 257).

However, the RTA prepared its own Environmental Impact Assessment which considered the benefit-cost ratio to be between 1.0 and 1.5. The RTA considered the tunnel to be viable.

The NSW Government announced that it would not call for tenders to develop the facility. Mills (1991, p. 280) suggested that such a course may have been viewed as being unfair to the private consortium which had already invested substantial capital in a feasibility study.

Key financial arrangements

The arrangements for the financing of the tunnel's construction are shown in Table A.1. The loan from the RTA is interest-free with repayment due in 2022. Mills (1991, p. 282) calculated the (1989) present value² of this loan to be worth only about \$40 million and argued that the RTA's loan could be reinterpreted as a \$180 million grant. The RTA's loan is also subordinate to all other liabilities of the Tunnel Company.

¹ Travers Morgan Pty Ltd were commissioned by the RTA to conduct a study on the economic evaluation of a Sydney Harbour Tunnel.

² Mills used a real rate of discount of one per cent per annum based upon the mid-point of the inflation assumptions used in the Tunnel Act.

Table A.1: Source of funds for construction, 1987–1992

<i>Source of funds</i>	<i>Approximate amount</i>
	(\$million)
Net Bridge Revenue “loan” (from the RTA)	223
Corporate bonds	497
Loan from Tunnel Holdings Pty Ltd	40

Source: NSW Auditor-General 1994.

The level of the tunnel toll was capped by the level of the bridge toll which was increased to \$1 in 1987. Subsequent increases are linked to the CPI. However, when the tunnel commenced operation, the toll level was increased to \$2, an increase greater than the underlying inflation rate.

The RTA agreed to pay the Tunnel Company an Ensured Revenue Stream which was to:

... enable the Company to meet financial obligations in connection with the operation of the Tunnel and the payment of principle and interest upon moneys borrowed by it for the design, construction and operation of the Tunnel. (Ensured Revenue Stream Agreement as quoted in NSW Auditor-General’s Office 1994, p. 278).

These payments are to be made for the 30 years that the Tunnel Company is to operate the facility. The payments are calculated according to the government’s intention to use toll receipts from both the Sydney Harbour Bridge and the Tunnel to finance the tunnel. The Tunnel Company receives the toll revenue collected from the tunnel and the Bridge less toll collection costs.

The RTA granted a lease of 35 years (expiring August 2022) on the floor of Sydney Harbour and associated areas to the Tunnel Company. It appears that this lease was provided free to the Tunnel Company.

Allocation of risks

According to the NSW Auditor-General, the Tunnel arrangements place a substantial proportion of the project risk with the RTA (Table A.2).

The NSW Auditor-General’s Office argued that the RTA carries the operating risks associated with the tunnel because of the way in which the Ensured Revenue Stream is calculated. The RTA is obliged to make additional payments to the Tunnel Company if the inflation rate is lower than projected

and actual traffic volumes are below projected (NSW Auditor-General 1994, pp. 285-286).

Table A.2: Allocation of risks in the Sydney Harbour Tunnel project

<i>Risk</i>	<i>Road and Traffic Authority</i>	<i>Transfield – Kumagai Group</i>	<i>Bondholders</i>
Construction risk	partial	primary	no
Traffic risk	total	–	–
Financing risk	primary	partial	partial

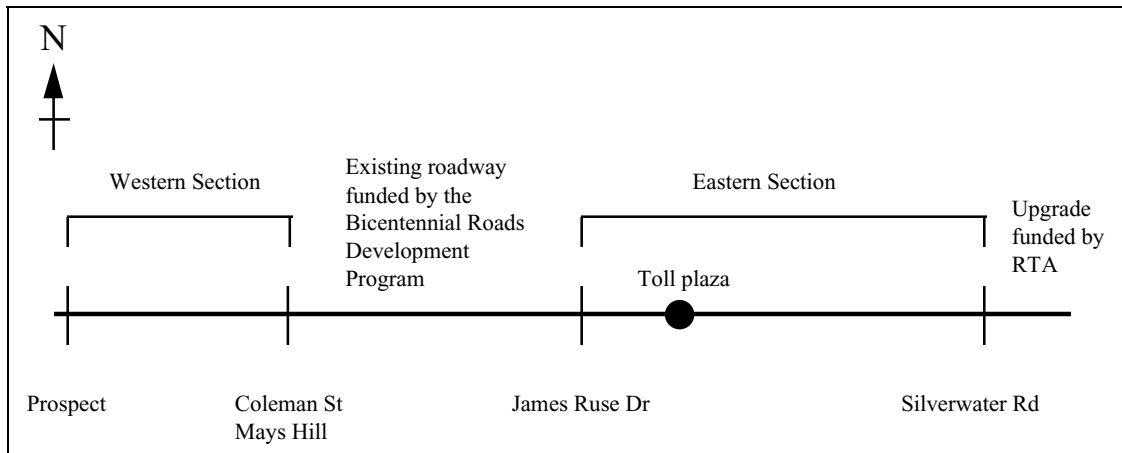
Source: NSW Auditor-General's Office 1994, p. 269.

The NSW Audit Office (1996, p. 2) argued that the RTA carries the primary financing risks because, although finance for the project was raised by issuing bonds fully underwritten by the private sector, the responsibility for those bonds rests with the State.

A.2 M4 tollway

The M4 toll road project involved the construction and widening of two sections of roadway (Figure A.1). The Western Section involved constructing a new six-lane freeway between Mays Hill and Prospect. Works on the Eastern Section required the widening of an existing roadway from four to six lanes between James Ruse Drive and Silverwater Road. The two sections are linked by an existing six-lane freeway that was funded under the Australian Bicentennial Roads Development Program.

Figure A.1: M4 tollway



Following tendering of the M4 project, the developers and the RTA also agreed to an up-grade of the section east of Silverwater Road.

Originally, the agreed tollway construction period was 30 June 1990 until 15 February 1993 when it would commence operating as a tollway. However, construction was completed nine months ahead of schedule allowing the tollway to begin operating on 15 May 1992. The developers have a concession to operate the tollway until 2010 when ownership reverts to the State at no cost.

Project history

According to the NSW Auditor-General's Office (1994, p. 354), the M4 was considered to be financially viable due to the high number of vehicles using the existing freeway. The M4 was also the most desirable of a range of alternatives, including upgrading the existing Great Western Highway and constructing an alternative freeway.

The NSW Government called for expressions of interest in the project, to be built under a BOOT scheme, in July 1988. The public tender process short-listed three potential developers of the M4 with the final contract being won by State Wide Roads Ltd (SWR).

The 'additional works' required for the up-grade of the roadway east of Silverwater Road were not tendered, but were awarded to SWR without calling for expressions of interest. The 'additional works' were incorporated into the M4 Project Deed.

Key financial arrangements

The M4 was constructed at a cost of \$110 million (1988 prices) with the total capitalised project cost estimated at \$246 million (1988 prices).

Details on how the capital cost was financed do not appear to be available. However, the 'additional works' were funded by the RTA because 'it represented an upgrade of areas not classed as the tollway' (NSW Auditor-General's Office 1994, p. 363).

Capital costs are recouped through toll receipts collected at the toll plaza. Toll levels are maintained at a real value of \$1 for cars and \$3 for trucks. The toll will increase in line with inflation in 50 cent increments.

There is only one toll plaza which is located in the Eastern Section of the freeway. Originally, the toll plaza was located in the Western Section but it was not considered financially viable by the project's financiers (NSW Auditor-General's Office 1994, p. 358). Currently, there are no tolls imposed on the Western Section.

SWR is required to pay rent for the land on which the toll road is built. Rental payments include \$22 million to be paid on or before the commencement date and the sum of \$24 million on 31 May 1991.

In January 1997, the NSW Government introduced a cashback scheme that reimburses private motorists for the full amount of tolls paid. This scheme was introduced in response to an electoral promise from the then opposition party, that, if elected, the M4 (and M5) agreements would be terminated. The cashback scheme is estimated to cost \$74 million and will be funded from consolidated revenue (Premier of NSW, New Release, 1996).

Allocation of risks

Prior to the introduction of the cashback scheme, the RTA carried few of the risks associated with the project (Table A.3). According to the NSW Auditor-General's Office (1994, p. 359), SWR carried the risk that the actual cost of the project was greater than the estimated cost (construction risk) and actual revenue was less than estimated (traffic risk). The arrangements also placed the financing risk of the project with the project's financiers.

Table A.3: Allocation of risks in the M4 project

<i>Risk</i>	<i>Roads & Traffic Authority</i>	<i>Statewide Roads Pty Ltd</i>	<i>Commonwealth Bank (financiers)</i>
Construction risk	–	yes	
Traffic risk	–	yes	
Financing risk	–		yes

Source: NSW Auditor-General's Office 1994, p. 358.

However, the NSW Auditor-General's Office (1994, p. 359) noted that the location of the toll plaza in the Eastern Section of the M4 moderated revenue risk because, on the Western Section, the greater number of exits and entrances meant that motorists could by-pass the toll.

SWR also negotiated arrangements that provide compensation to SWR should the Government impose:

... new laws, discriminatory taxes or [alter] the interpretation of existing laws which either discriminate against the company, has the effect of increasing the cost of the project or preventing SWR from constructing and operating the tollroad (NSW Auditor-General's Office 1994, p. 359).

If these events occur, SWR is entitled to an extension of the lease or financial compensation for early termination. It is not clear if dispute resolution mechanisms are in place.

A.3 M5 tollway

The M5 tollway completes a link from Casula, in south western Sydney, to Kyeenagh in inner Sydney (Figure A.2). The tollway was constructed in three stages.

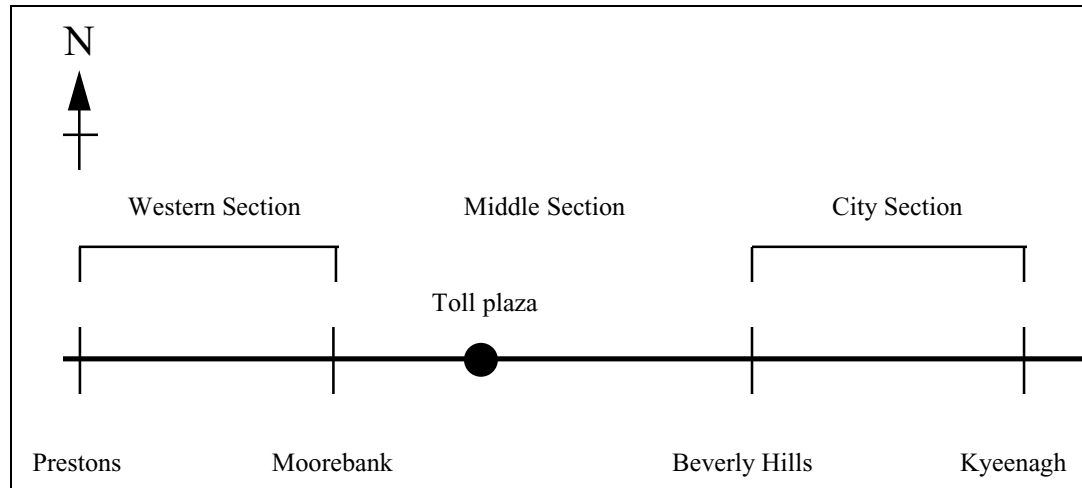
Stage one involved constructing a carriageway between Beverly Hills and Moorebank (known as the Middle Section). Construction was scheduled for completion by February 1995 but was actually completed earlier allowing the road to be opened in October 1992.

Stage two involved the construction of a link between Moorebank and Prestons (known as the Western Section). Stage three originally involved building a carriageway between Beverly Hills and Alexandria. This proposal was changed to extend the carriageway beyond Alexandria to Kyeenagh.

It is intended that interchanges be constructed at five locations along the tollroad to provide connections with Belmore Road, Fairford Road, The River Road, Henry Lawson Drive and Heathcote Road.

The developers are to operate the toll road for around 30 years at which point ownership would revert to the NSW Government at no cost.

Figure A.2: M5 tollway



Project history

Although there is some suggestion that the M5 was first proposed in 1948, the first effective analysis of its benefits was in 1985. An environmental impact statement found the project could provide benefits in terms of:

- alleviating traffic congestion;
- improving the level of service between the expanding south western areas; and
- providing a safe and efficient transport system (NSW Auditor General's Office 1994, p. 371).

The tender for stage one of the project was awarded to Interlink Roads Pty Ltd, an equally owned subsidiary of Leighton Holdings Ltd and the Commonwealth Bank. Stage two of the project (the Western Section) was assessed by the RTA as being uneconomic as a separate private tollway. Consequently, it was originally intended that the RTA build stage two (no tolls were to be imposed) but Interlink proposed that stage two be developed as a toll-free extension of stage one:

This proposal was put six months after the opening of stage one and following recognition that traffic volumes entering stage one were lower than originally anticipated (NSW Auditor-General's Office 1994, p. 374).

Key financial arrangements

The cost of constructing the Eastern and Middle Sections of the M5 was \$295 million. This was financed as follows:

- Interlink took out a loan with the Commonwealth Bank for \$250 million;
- the RTA provided a \$35 million loan; and
- the RTA provided a \$10 million 'construction payment' to cover the cost of additional works requested by the RTA.

The RTA acquired the additional land requirements at a cost of around \$22 million. Interlink was then granted access to this land to allow them to construct the Eastern and Middle Sections. Rental payments for the use of this land is not required until the tollway has opened.

The Western section was not a true BOOT scheme as it was never intended that this be part of the toll road. The \$65 million cost of construction was largely financed by a \$50 million RTA loan. Interlink contributed \$15 million via a loan from the Commonwealth Bank. The RTA is entitled to 70 per cent of any savings in construction cost.

Tolls are pegged for the first three years and then escalate at CPI. However, as on the M4, the NSW Government has introduced a cashback scheme on the M5 that reimburses private motorists for the full amount of tolls paid.

Allocation of risks

Prior to the introduction of the cashback scheme, the NSW Auditor-General's Office found that, while the arrangements for the M5 are an improvement upon those concluded for the Tunnel, the RTA bears some of the risk associated with the project (Table A.4). Much of this risk extends from the financial arrangements underlying the additional works agreed to by the parties. The loan extended to SWR by the RTA for the completion of the additional works places a significant proportion of the financing risk of the project with the RTA.

Table A.4: Allocation of risks on the M5 project

<i>Risks</i>	<i>RTA</i>	<i>Interlink</i>	<i>Commonwealth Bank</i>
Construction risk	–	Primary	–
Traffic risk	–	Primary	–
Financing risk	Primary	Partial	Primary (but less than RTA)

Source: NSW Auditor-General's Office 1994, p. 385.

A.4 M2 tollway

The M2 Tollway extends from Epping Road, North Ryde to Old Windsor Road, Baulkham Hills. The construction of the M2 provided a four lane expressway, a two lane busway, a combined bicycle and breakdown lane, one set of twin tunnels and a number of bridges, overpasses and underpasses.

Project history

Construction of the M2 was first proposed in 1989 as a motorway running between Carlingford and North Ryde in Sydney's northern suburbs. Following public criticism of the project, the then NSW Government formed a Commission of Inquiry (the Woodward Commission) to examine the merits of the project, under the guidelines set out in the NSW Environmental Planning and Assessment Act.

The Woodward Commission found the proposed road would not solve all traffic congestion problems and would have a significant adverse environment impact. The Commission considered the upgrading of existing roads, together with improvements in public transport, to be a more effective solution to congestion problems.

In response, the RTA revised the original proposal, extending the motorway further west beyond Carlingford to Baulkham Hills. After receiving public comment on the new proposal, the RTA issued an Environmental Impact Assessment Report in May 1993 which supported the construction of the entire project.

Construction of the M2 aimed to correct deteriorating road infrastructure and alleviate congestion between Sydney and Parramatta. It was also hoped that the M2 would develop Parramatta as an alternative business centre and link the

north west region of Sydney with the employment, commercial and educational areas of Parramatta, Macquarie, North Ryde and the Lower North Shore (Australian Constructors Association 1997, p. 20).

Key financial arrangements

The (approximate) \$600 million capital cost of the M2 project was raised as follows:

- initial equity raised through an \$155 million Australian Stock Exchange public offering;
- an issuance of \$200 million of debt in two tranches of inflation-adjusted 27-year bonds;
- a \$365 million, reducing to \$120 million post-completion, 15-year syndicated bank loan; and
- \$30 million in sponsor equity injected on completion of construction.

Allocation of risks

According to the NSW Audit Office (1995, p. 13), the M2 arrangements place the majority of the risk burden with Hills Motorway. Those risks borne by Hills Motorway include the risks associated with:

- establishment costs;
- financing;
- construction;
- operations; and
- maintenance.

The Audit Office argued that the RTA bears some (but not all) of the traffic risk associated with the project because of the nature of the rental arrangements for the land upon which the M2 is constructed:

Should traffic projections assumed by the developers prove to be unachievable, revenue to Hills would be lower than forecast. If a specified (threshold) internal rate of return is not achieved by Hills, rent payable by Hills to the RTA (for use of the land occupied) is able to be replaced by a non-interest bearing promissory note, which is subordinate to other debt of the project (NSW Audit Office 1995, p. 20).

The RTA, however, disagreed with this assessment arguing that the Auditor-General's argument was contrary to the legal obligations entered into by the parties (NSW Audit Office 1995, p. 19).

Risks borne by the RTA include land title, discriminatory action against the M2, the adverse effects of substitute public transport and State or Commonwealth taxation changes (excluding income tax changes) materially affecting the project's gross revenue (NSW Audit Office 1995, p. 13).

The NSW Audit Office (1995, p. 13) concluded that:

All in all, the RTA has handled risk allocation in a noticeably clearer way in these M2 arrangements than in previous arrangements for Motorways and the Tunnel (NSW Audit Office 1995, p. 13).

A.5 City Link

City Link involves linking three of Melbourne's central freeways — the South Eastern, West Gate and Tullamarine Freeways — through the construction of 22 kilometres of road, tunnel and bridge works.

The project involves construction, operation and maintenance of two sections of roadway. The first section (Western Link) connects the Tullamarine Freeway with the West Gate Freeway while the second section (Southern Link) extends the West Gate Freeway by two tunnels to join up with the South Eastern Freeway.

The Western Link will comprise around 13 kilometres of new and upgraded freeway conditions including:

- an upgrade to eight lanes of the Tullamarine Freeway between the Bulla Road and Flemington Road intersections;
- a six lane elevated roadway connecting the Tullamarine Freeway at Flemington Road to Footscray Road; and
- an extension of the above elevated roadway from Footscray Road to the West Gate Freeway at Graham Street, including the construction of a bridge over the Yarra River.

The Southern Link involves the construction of around eight kilometres of freeway including:

- a 3.4 kilometre three lane east-bound tunnel;
- a 1.6 kilometre three lane west-bound tunnel; and
- an upgrade of the South Eastern Freeway between Toorak Road and Punt Road intersections.

Completion of the Western Link is expected in April 1999 and the Southern Link in December 1999.

The City Link project also incorporates State Works which mainly include:

- widening of the Tullamarine Freeway from Moreland Road to Bulla Road;
- rail infrastructure modifications for the Upfield railway line;
- modifications to the South Eastern Freeway;
- implementation of certain traffic management measures involving specific changes to the existing road network in the vicinity of the Link; and
- rectification of certain specified imperfections in existing structures that are to be incorporated as part of the Link.

Project history

Proposals for the linking of existing roadways surrounding Melbourne's Central Business District date back to the 1950s and 1960s. However, genuine interest only surfaced in the late 1980s as traffic became increasingly congested within Melbourne. Links between the freeways developed in the 1970s and 1980s were proposed as possible solutions to this congestion problem.

In 1994, VicRoads released an Environmental Effects Statement on the Western Link and Southern Link. The statement considered a range of transport options for alleviating congestion around Melbourne and provided for comprehensive consultation with the public and interested parties on the proposed options. The statement concluded that the links provided the best solution to the traffic problems. VicRoads' findings were supported by the findings of public inquiry into the Environmental Effects Statement.

VicRoads issued a brief to interested parties calling for registration of interest to build, own and operate the links. An assessment panel short listed the project proposals which were assessed against predetermined criteria made available to potential bidders.

Following assessment of the proposals, two consortia, Transurban City Link Ltd and CHART Roads, were short-listed for development of the links. In 1994, these consortia were then issued with the project brief which specified the project requirements. In 1995, following detailed assessment of the project bids by each consortia, Transurban was nominated as the preferred consortia.

Transurban is a joint venture between Transfield Pty Ltd and the Obayashi Corporation. Transurban is to operate the roads for 34 years at the conclusion of which ownership reverts to the Victorian Government at no cost.

Key financial arrangements

The estimated capital cost of City Link is \$1.8 billion, of which around \$1.1 billion comprises the cost of construction (Transurban Annual Report 1996). The capital cost is being financed through:

- a \$55 million capital injection from Obayashi and Transroute International (a French company with experience in tollway operation);
- \$1.3 billion of debt financing including \$1.249 billion worth of infrastructure bonds; and
- a further \$51 million facility to finance the purchase of initial transponders (Transurban Annual Report 1996).

The \$266 million worth of State Works is to be financed by the State.

Transurban is required to pay the State annual fees (known as concession fees) to compensate the State for the financial assistance of around \$219 million provided to the project by way of land and funding of certain works associated with the project.

Transurban is to finance the capital cost of the project through the collection of tolls from users of the facility. Tolls are to be collected through an electronic tolling system and are capped by an escalation mechanism. Movements in the maximum tolls must comply with the following rules:

- for the period January 1995 to 15 years following the date of Link completion, the maximum tolls that can be charged will escalate at an annual rate equivalent to the greater of 4.5 per cent and the CPI; and
- for the period from 15 years following completion to the end of the concession period, the maximum toll that can be charged will escalate quarterly at CPI (Victorian Auditor-General's Office 1996, p. 129).

Allocation of risks

According to the Victorian Auditor-General's Office (1996, p. 127), the risks associated with the design and construction of City Link are principally borne by Transurban. Transurban will also:

... bear the risk of reductions in traffic volumes associated toll revenues brought about by various factors including:

- incorrect traffic flow projections;
- adverse economic conditions;
- changing travel patterns and habits; and

- increases in the prices of petrol (Victorian Auditor-General's Office 1996, p. 129).

However, this risk is to some extent mitigated by State undertakings that requires associated freeways and principal traffic routes be managed in a manner that gives City Link status as a central part of the road network (Victorian Auditor-General's Office 1996, p. 130).

The Victorian Auditor-General's Office (1996, p. 130) also found that the risks associated with the effective and efficient operation of the electronic toll collection system and of operation, maintenance and repair have been transferred to Transurban. The Victorian Auditor-General's Office also noted that:

... the key financing risks associated with the delivery and operation of City Link have been effectively transferred to Transurban. The State has not absorbed these risks, given that no indemnities have been provided to Transurban or its lenders in relation to the repayment of the project debt or the level of toll revenue. However, the State has undertaken to assume responsibility for any outstanding project debt in the event that the Concession Deed is terminated (Victorian Auditor-General's Office 1996, p. 137).

B MEETINGS AND VISITS

Commission staff held discussions with the following organisations during the course of this study.

Australian Capital Territory

Commonwealth Treasury

Invest Australia

New South Wales

Audit Office of New South Wales

NSW Treasury

Macquarie Corporate Finance Limited

NRMA Limited

Roads and Traffic Authority

Transfield Pty Ltd

Victoria

Allen Consulting Group Pty Ltd

Australian Accounting Research Foundation

Department of Treasury and Finance

Melbourne City Link Authority

Royal Automobile Club of Victoria (RACV) Ltd

Standard & Poors

Transurban City Link

Victorian Auditor-General's Office

Vicroads

GLOSSARY

Build Own Operate (BOO)	An arrangement where the private developer builds, owns and operates a facility but there is no eventual transfer back to the public sector. The private sector owns the facility in perpetuity.
Build Own Operate Transfer (BOOT)	A contractual agreement between the private sector and the government. The private sector is given a <i>concession</i> to construct and operate an item of infrastructure. Included in this is the right to charge users of the facility a fee in order to recoup the costs of construction and maintenance. At the end of the concession period ownership of the infrastructure reverts to the government.
Build Transfer Operate (BTO)	Essentially a buy and lease back option where the public sector takes ownership of the project on completion and leases it back to the private developer.
Community Service Obligations (CSOs)	The non-commercial programs and activities of government business enterprises (GBEs) designed to meet community and social objectives determined by government. For instance, these obligations might require GBEs to provide specific goods and services or to subsidise prices for some consumers.
Competitive Tendering and Contracting (CTC)	The use of external suppliers under contract to deliver goods or services to, or on behalf of, government or government owned entities. Contractors are usually selected on the basis of competitive tendering.
Concession	The government grants a private contractor exclusive rights to operate the a facility and collect revenues from providing that service for a predetermined period.
Cost Benefit Analysis (CBA)	A procedure for the economic evaluation of projects or programs by reference to the net social benefits that they produce. Benefits and costs are social

	rather than private in the sense that they are measured irrespective of the people to whom they accrue. CBA assigns monetary values to all the major costs and benefits associated with a project or program to allow comparison of options.
Discount rate	The discount rate is used to calculate the present value of the future streams of costs and benefits associated with a project or program. It reflects a preference for receiving benefits sooner rather than later, and in incurring costs later rather than sooner.
Equity funding	Equity funds are provided to acquire shares - that is, equities. Equity funding differs from debt funding in that equity investors bear more risk being subordinated to debt finance. The return on the equity investment (dividends) may be variable, usually depending upon the profitability of the enterprise. Due to the higher risk, equity investors require a higher expected rate of return than do lenders.
Externality	A benefit or cost falling on third parties the value of which is not reflected in the market price. An external benefit is often termed a positive externality; an external cost a negative one.
Force majeure	Unforeseeable course of events excusing the contractor from fulfilment of a contract.
Hurdle rate	In investment appraisal, the minimum acceptable rate of return of a project for it to proceed.
Intellectual property	Patentable ideas, concepts, theories or inventions of a company.
Material Adverse Effect (MAE) clause	Such a clause gives the private contractor redress against the government should it implement any government policy changes or approve projects that cause detriment to the BOOT projects revenue during the concession period. The main purpose of this clause is to overcome moral hazard on the part of the government and to protect the BOOT contractor from sovereign risk.

Natural monopoly	An industry in which the entire output of the market can be supplied by a single entity at lower cost than any combination of two or more entities.
Network risk	Network risk is the variability in demand in one part of a network caused by changes of circumstances and demand in other parts of the network.
Non-recourse project finance	A financial structure where investors rely on the performance of the project for payment rather than the credit of the sponsor. Investors have limited recourse against the sponsor if the project fails to generate adequate returns.
Option value	The price people are willing to pay for an assurance that the good or service will be available at a pre-determined price.
Rate of return	Profit earned expressed as a proportion of the capital investment.
Regulatory risk	The risk that there may be changes in government policy during the development and operation of a project. Government policy in the infrastructure area covers, among other things, planning requirements, pricing of services, environmental requirements and the conditions governing the entry of new competitors. Regulatory or policy risks are present throughout the life of the infrastructure project.
Risk	The degree of dispersion of future returns from their average expected value.
Risk neutral	A risk neutral decision maker invests solely according to the expected profit of the project, and completely ignores the dispersion of returns.
Sovereign risk	The risk that the government will refuse to honour some aspect of a contractual agreement.
Take or pay contracts	An agreement to make some minimum payment for a good or service provided, whether or not that good or service is actually taken or used. In effect, such contracts put a floor under project returns.

Traffic risk	See network risk.
Transaction costs	Costs incurred in a transaction. These include time costs and legal costs.
Uncertainty	Is distinguished from risk by the absence of prior probabilities. The situation or occurrence is to a high degree unique.
User-pays pricing	Prices charged for goods and services that reflect the cost of provision.
Value capture	This term refers to the 'capture' of the increase in land value which results from an infrastructure project.

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