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Roads to riches

Better transport investment

Marion Terrill



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Overview

Governments have spent unprecedented sums on transport infrastructure in the last decade. But mostly, they have not spent wisely.

Some of the additional spending can be attributed to unusual events such as the mining boom, the Global Financial Crisis and the Queensland floods. But even leaving these aside, too much money has been spent on the wrong projects in the wrong places.

For one thing, investment has not put cities first, though they are the engines of national economic growth. Our largest cities face increasing congestion and competition between passengers and freight. Yet governments have largely bypassed them to spend in states and electorates where federal elections are won and lost.

Too often, politics comes ahead of the public interest. Too much has been spent on highways that are not especially important to the economy, but are popular with local voters. Decisions on particular projects are dubious or made on the basis of weak or undisclosed business cases. The Commonwealth and Victorian governments spent \$438 million on the Geelong to Colac road, not a project of national economic significance. Canberra's light rail, now being built, is likely to provide no more benefits than bus rapid transit but cost more than twice as much. Although governments have funded many worthwhile projects over the past decade, the overall investment has been poorly directed. An ad hoc approach results in missed opportunities and a lot of waste.

One difficulty is that there is little to stop politicians committing to projects before they are properly evaluated – particularly during election campaigns. Without more public information on potential projects, the public can't be sure that funds will be spent wisely.

Recognising the problem, Commonwealth and state governments have established new bodies, such as Infrastructure Australia, to improve infrastructure spending. This is a positive move. But in their current form, these bodies have limited impact.

A better approach would involve three steps. Governments currently cherry-pick the evaluation method that suits the result they want. Instead, they should not be able to commit to a transport infrastructure project before tabling in parliament a rigorous like-for-like evaluation of the net benefit, conducted by an independent body.

Governments would then be free to make and defend decisions on the basis of a clear rationale for investment. Politicians would be less eager to invest in projects that don't stack up.

Once governments are only building projects where the community benefit clearly outweighs the cost, their second step should be to aim to build *all* such projects. Quality assessment, not arbitrarily imposed budgetary limits, should determine the level of investment. In other words, if a project has net benefits to the community, the government should build it.

Third, Commonwealth funding for projects should be disentangled from states' GST entitlements. The Commonwealth should fund infrastructure that is important to the national economy, regardless of where it is based. It should not then override its own allocations by compensating states that did not receive funds.

More disciplined selection of infrastructure projects would have a double benefit. It would mean less wasteful spending and better transport networks, built where they will make the most difference.

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1 Spending has been very high in the past decade

The main purpose of transport infrastructure is to enable people to commute to work reliably and safely, buy goods without excessive transport costs or delays, and use services that rely on others being able to get to where they are needed. Most of the time, transport is an intermediate step to people getting to work and moving goods and services to the people who want them. Roads and railways that support the nation's economy make the nation as a whole better off, even though different people will inevitably have different levels of access to transport connections.

The key goals for transport infrastructure policy should be that any government spending be in the public interest, and the public be confident this is the case.

This section outlines the context for transport infrastructure investment: how much has been spent and how much is enough, who funds it, where the spending goes and how decisions are made.

Section 2 examines where the demand for transport infrastructure lies and how it is changing.

Section 3 assesses how well transport infrastructure investment served national and state priorities over the past decade.

Section 4 explores some of the evidence of poor spending decisions.

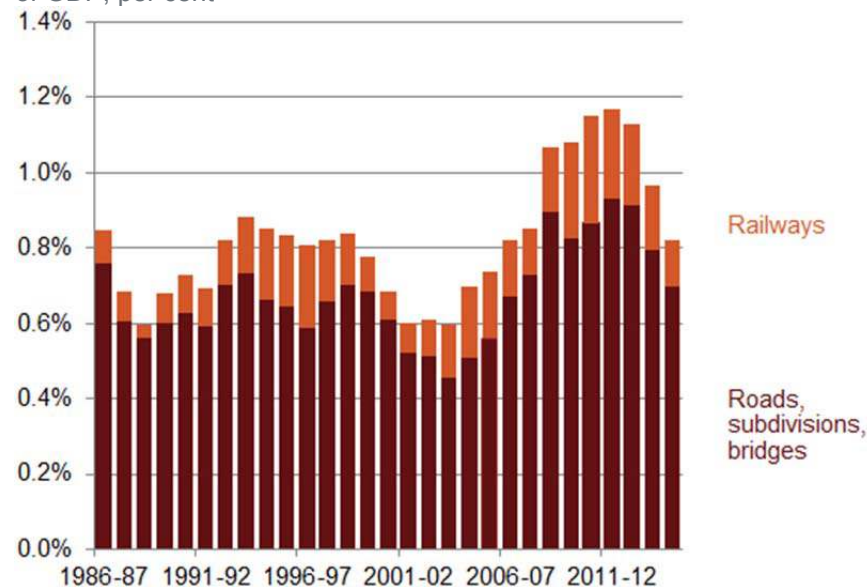
Section 5 concludes with recommendations for how governments could improve investment in this expensive and critical area.

1.1 Spending has been very high in the past decade

Over the past decade government spending on new transport infrastructure has been very high by international standards and the highest in Australia's history since records were first collected in 1987. Spending on roads and rail rose from 0.6 per cent of GDP in 2003-04 to 1.2 per cent in 2011-12 (Figure 1.1).

Figure 1.1: Spending on transport infrastructure has risen sharply over the past decade

Engineering construction work done for the public sector as a proportion of GDP, per cent



Notes: Includes work done by the private sector for the public sector.

Source: ABS (2016b), Table 11; ABS (2016a), Table 3.

The decade was unusual in some ways. The mining boom created a need for more transport infrastructure for the export of minerals. The global financial crisis led to stimulus spending by government, some of which was directed into transport infrastructure projects. The Queensland floods caused extensive damage to transport infrastructure that had to be rebuilt.

While these events were unusual, they only explain a part of what happened. There is scant information publicly available to explain what else was behind the high levels of spending. This report uses the limited information that is publicly available, and finds that at least some spending on transport infrastructure is hard to explain or justify as improving the nation's capacity and prosperity. It shows that sometimes the decision to proceed with a project came before an assessment of whether it was worthwhile, and sometimes projects that were not worthwhile went ahead anyway.

The report analyses capital spending on transport infrastructure by the Commonwealth and state governments over the decade 2005-06 to 2014-15.¹ It looks at the whole decade to avoid single-year spending effects, which can be large and lumpy for transport infrastructure spending. Ten years does not cover the full life-span of a road, railway line or bridge – and for this reason the report considers a further five years of data when analysing parts of the national highway network (Section 3.2.3 and Section 4.3) – but it does allow a focus on a decade notable for particularly high spending.

¹ This includes capital investment by the public sector included in states' capital investment budgets. It includes all items relating to transport infrastructure (i.e. roads, rail, ports, public transport, airports, bicycle infrastructure). It does not include recurrent (i.e. operating) expenditure, which, in the case of transport infrastructure, relates to maintenance.

This report analyses spending as reported in Commonwealth and state budget papers. These budget papers are prepared by departments of finance and treasury each year and include details of most government spending, although different jurisdictions report different levels of detail. The report has benefited from additional detail provided by the Commonwealth Department of Infrastructure and Regional Development on the composition of spending in the budget papers and unpublished data on traffic flows on highways. The report also uses two sources of data on road asset quality.²

1.2 How much extra transport infrastructure is needed?

Many people sense that Australia is suffering from an infrastructure deficit. Anyone who suffers through peak hour congestion in the major capitals can feel frustrated by the discomfort and wasted time. Lobbyists, financiers, their advisers and governments often claim that there is a significant infrastructure gap,³ and sometimes try to quantify the spending required to fill it. However, the evidence and methodologies to substantiate such claims are not convincing.

In fact, it is far from obvious how one could rigorously determine whether an infrastructure deficit exists. Most estimates of Australia's 'infrastructure deficit' appear to be based solely on counting up the value of some list of potential projects that could

² COAG Transport and Infrastructure Council (2015); Australian Automobile Association (2013)

³ For instance, Engineers Australia regularly calls for major changes on the basis of a qualitative assessment (Engineers Australia (2010)). Infrastructure Australia estimated the deficit at \$300 billion (Infrastructure Australia (2013), p.6), although it has not published the methodology behind this estimate. The Treasury Secretary spoke recently to an international audience of 'the infrastructure deficits we all face' (Fraser (2016)).

be built in the future, whether or not they would deliver value for money.⁴ Such estimates also conflate the value of infrastructure that may be needed in the future to meet future demands with an 'infrastructure deficit', implying that current infrastructure is inadequate to meet current needs.

Neither is it enough merely to point to congestion; if there were never any congestion at all, it would suggest that we had spent far too much on deserted roads, idle ports and empty trains.⁵

When governments make transport and planning decisions in Australia, they do so against a backdrop of a system that is already mature. Governments are not deciding how to build the entire system from scratch; the question of how much we need is really about what additions to the system we need the most.

The key question for government is how to determine that any potential addition to the transport system is worthwhile, and better than the alternatives.

There is a way to do this. It is to assess all potential additions on a like-for-like basis, and build those where the benefits outweigh the

⁴ For example, Infrastructure Partnerships Australia cites an 'infrastructure deficit' of \$700 billion having identified 160 'critical' projects, which were estimated by external parties to cost more than \$700 billion (Infrastructure Partnerships Australia (2009), p.6); Infrastructure Partnerships Australia (2007)). Similarly, the Business Council of Australia argued for the delivery of a \$921 billion pipeline of projects made up of those under construction, committed, under consideration or 'possible' (Business Council of Australia (2012)).

⁵ For example, the widely cited projections of the economic and social cost of congestion on urban roads published by Infrastructure Australia, which show an expected rise in congestion costs from \$13.7 billion in 2011 to \$53.3 billion in 2031, do not account for any new investments in transport infrastructure between 2015 and 2031, apart from projects which are already under construction (Infrastructure Australia (2015b), p.32).

costs. Despite its limitations, the best approach that exists today to making like-for-like comparisons is cost-benefit analysis (Appendix A).

The key question then is when to stop. Transport infrastructure is expensive, and determining when to stop is a decision that governments tend to make as part of their overall budget strategy. Transport infrastructure is also long-lived, and so phasing projects can also make sense to keep options open when technology or other changes affect the need for a piece of infrastructure. Phasing projects also helps to avoid 'boom and bust' demand on the construction industry.

If all potential projects whose proponents were seeking public money were rigorously and independently assessed on a like-for-like basis, and the assessments were transparent to the community and to decision-makers, wasteful spending would be kept to a minimum, and the community would get the best value for every dollar of public money spent on transport infrastructure.

What is more, there is no reason why governments should not build *all* projects where the benefits outweigh the costs.⁶ At the moment, annual overall budget limits impose discipline by limiting funds; spending discipline could instead apply through quality assessment. If a project has benefits that outweigh its costs, then it is reasonable to argue that the government should go ahead with it.

⁶ Of course, if a project offering net benefits today would offer even higher net benefits later on, which outweighed the benefits forgone by waiting, it would make more sense to delay it. This issue is discussed in Appendix A.

1.3 Making the most of existing transport infrastructure

The need for new transport infrastructure depends on how well existing infrastructure is maintained and used.

One way to get more value from existing infrastructure is through a more systematic approach to maintenance. The operational costs of maintaining long-lived assets can be many times greater than the planning and building cost. Even though Australia's investment level is the highest of OECD countries, maintenance levels are among the lowest (Figure 1.2). Australia spent only 15 per cent of transport infrastructure funds on maintenance in 2013 compared to 25 per cent a decade ago.⁷ Infrastructure Australia recently concluded that sections of the infrastructure base are 'already in poor or declining condition'.⁸

Maintenance can often be deferred for a time without immediately visible effects. But neglecting maintenance not only reduces the effectiveness of the infrastructure to users, but can also lead to extra expense on remedial work and premature replacement.⁹

A second way to get more value from existing infrastructure is through well-designed user charges. Cost-reflective user charging would constrain usage of transport infrastructure without prohibiting any specific trip.

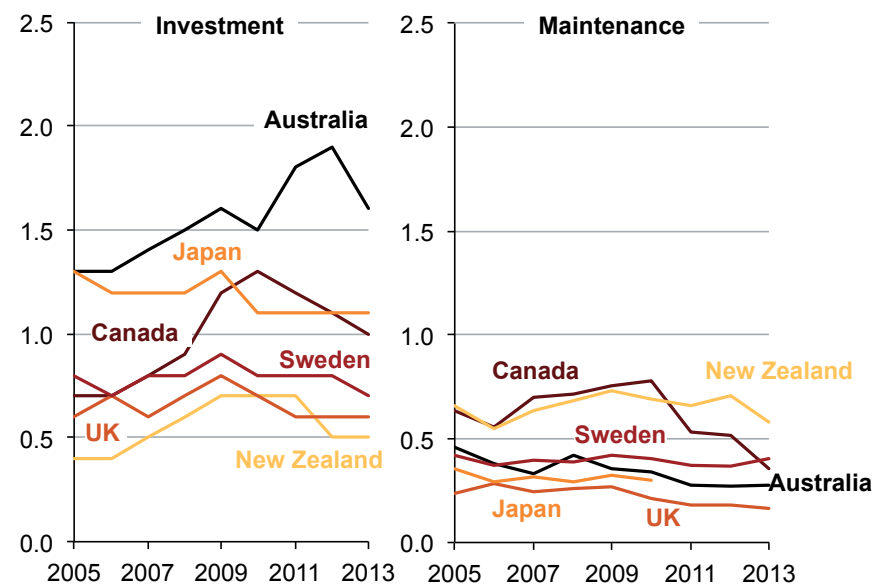
⁷ OECD (2016)

⁸ Infrastructure Australia (2016a), p.80

⁹ For example, some commentators suggest that by adopting a 'total cost of ownership' approach to managing infrastructure assets, countries such as Denmark have reduced the expense of maintaining its road network by some 10 to 20 per cent (Dobbs, *et al.* (2013), p.7).

Figure 1.2: Australia's spending on investment is high by OECD standards, but maintenance spending is low

Transport infrastructure investment and maintenance, per cent of GDP



Notes: Includes road, rail, inland waterways, maritime ports and airports and takes account of all sources of financing. Infrastructure investment covers spending on new transport construction and the improvement of the existing network. Infrastructure maintenance covers spending on preservation of the existing transport network.

Source: OECD (2016).

It could help to spread out the morning and evening peaks in congested cities, and would generate revenue that could be directed into the transport system. User charging would also provide a signal about whether capacity expansion was warranted.

User charges already fully or partly fund some types of transport infrastructure, including the main ports and the four largest airports of Sydney, Melbourne, Brisbane and Perth.¹⁰ Most freight rail infrastructure already operates on commercial terms, although extensions of the rail network are often funded by governments.

In the absence of cost-reflective user charging for roads and rail, these transport networks are likely to remain primarily funded by taxation. While a number of government reports have called for user charging,¹¹ particularly for roads, and small-scale trials are underway in several states, it is unlikely in the short to medium term that user charging will be of sufficient scale and maturity to provide meaningful signals about where capacity expansion is warranted. The recommendations in this report therefore focus on improving the effectiveness of the existing institutional arrangements governing investments in new transport infrastructure.

1.4 Public infrastructure for economic growth

Governments' decisions about whether to build, how much and when are not only influenced by the merits of individual projects, but also by financing costs and the broader goals of economic growth.

Real interest rates, both globally and in Australia, are exceptionally low¹² and many experts believe that they likely to remain so for some time.¹³ Lower interest rates can improve the

case for particular infrastructure projects.¹⁴ As former chairman of the US Federal Reserve, Ben Bernanke, famously said: *at a negative (or even zero) interest rate, it would pay to level the Rocky Mountains to save even the small amount of fuel expended by trains and cars that currently must climb steep grades.*¹⁵

Infrastructure projects typically involve large upfront costs, and create value when the costs of funding them, including interest costs, are less than the economic and social benefits of the projects. There is a strong inter-generational equity argument for financing transport infrastructure using public borrowing. Today's travellers benefit from past investments in the transport network; so too will future generations benefit from investments in new transport infrastructure made today.

The broader global environment is of low economic growth and potentially poor prospects of improvement.¹⁶ Australia may face these risks too. Productivity will grow slowly at best in the absence of new investment. Governments overseas and in Australia can act to counter weak private investment by increasing their public investment levels.¹⁷ Australia has more flexibility to explore this option than many countries, because our public debt is modest by international standards.¹⁸

¹⁰ Infrastructure Australia (2016a), p.76

¹¹ Treasury (2010), Chapter E3; Productivity Commission (2014), p.141; Competition Policy Review (2015), p.38; National Commission of Audit (2014), p.22-4; Infrastructure Australia (2016a), p.9

¹² Haldane (2015)

¹³ Rachel and Smith (2015)

¹⁴ Obstfeld (2015) notes 'the case for infrastructure investment seems compelling at a time of very low long-term real interest rates.'

¹⁵ Bernanke (2015)

¹⁶ Summers (2012)

¹⁷ Rachel and Smith (2015)

¹⁸ Some commentators have raised concerns that building all projects where the benefits outweigh the costs would crowd out other state government capital spending, or lead to an explosion in public debt levels. However, there is no evidence that Commonwealth and state governments are pushing up against constraints on the level of their public borrowings. On the contrary, the

Robust independent assessments that show a project's benefits outweigh its costs make the case for government investment. Such investments are likely to enhance productivity and financiers will view them more favourably than debt to finance operating deficits. Without such assessments, there is a high risk that spending on transport infrastructure will be wasteful.

Where the overall costs of infrastructure projects exceed their benefits, increasing infrastructure spending will only destroy capital, lowering living standards and economic growth. As many have noted,¹⁹ and as the remainder of this report shows, this is a very real risk. Consequently, budget strategists have tried to counter the risk of wasteful spending by constraining the aggregate level of spending on infrastructure.

Greater discipline in the selection and management of infrastructure projects could produce a double benefit to the community. It would not only create bridges, railway lines and signaling systems that are worth more than they cost to build; it could also create the conditions for an increase in productivity.

1.5 Who funds transport infrastructure?

This report is concerned with infrastructure funding – the money that pays for infrastructure construction and maintenance over its life (see Box 1). The subject of infrastructure *financing* – the capital needed to pay for the investment costs upfront – will be covered in a future report.

There are three sources of transport infrastructure funding. Users can fund or part-fund infrastructure: for instance, airlines pay airport owners commercial rates to use take-off and landing facilities. The private sector also funds certain transport infrastructure for its own use, such as private rail lines to transport coal or iron ore from the mine to the port. But the primary funders of most transport infrastructure, including roads, rail, and public transport facilities, are governments. This report is concerned with governments' funding role.

Historically, governments have not only funded but also provided transport infrastructure. Government provision has offered a way of addressing market failures in transport infrastructure. One market failure is that transport infrastructure is generally a natural monopoly – in other words, it is generally more efficient to have one bridge, road or railway line than to encourage competing networks, where the infrastructure is accessible to all.

Commonwealth, NSW and Victorian state governments retain AAA credit ratings for their long-term public debt, which is highly unusual globally.

¹⁹ For example, see Productivity Commission (2014), p.75

Box 1: Infrastructure funding vs. financing

An important distinction in transport infrastructure policy is between infrastructure funding and infrastructure finance.

Funding of public infrastructure reflects who ultimately pays for the infrastructure to be built and maintained over its life. Funding can be sourced directly from users of public infrastructure, through tolls on roads and fares for public transport. It can also come from developer contributions on new housing estates, or levies on property owners whose property becomes more valuable when new infrastructure improves its accessibility (often known as ‘value capture’).

Although these mechanisms are widespread, most funding for transport infrastructure comes from the community through general taxation.

Financing of public infrastructure refers to the capital needed to pay for the investment costs up-front. Investments in public infrastructure can be financed from existing government revenues, government borrowing, or private finance.

The availability of private finance does not remove the need to identify a funding source for public infrastructure, since private financiers must ultimately be repaid.

Source: Committee for Melbourne (2012), p.1; Productivity Commission (2014), p.4-5

A second market failure is that transport infrastructure is a ‘public good’. This means that providing the infrastructure for one user does not prevent its use by others, and that it is hard to exclude users.²⁰ This market failure becomes salient as congestion in major cities is building to the point where an extra vehicle can materially reduce the ability of other drivers to use a road, and because new tracking technologies are starting to offer the realistic possibility of charging all users.

A third market failure is the externalities, favourable and otherwise of transport infrastructure. There are advantages of people having a wider choice of job opportunities to find their best match, and of an additional road link that improves the operation of other parts of the network. On the other hand, additional infrastructure may lead to more pollution and accidents.

Governments are involved in transport infrastructure because of these market failures, but government involvement does not have to involve direct provision. Governments also subsidise private providers and regulate the charges private providers can impose on users.

All three levels of government play a role in funding transport infrastructure. State governments play the primary role in economically important infrastructure, but they rely on Commonwealth contributions for about a quarter of the cost of new infrastructure.

The Commonwealth builds almost no transport infrastructure itself, but it provided around \$4.4 billion in 2014-15 to state governments as tied grants, known as National Partnership

²⁰ Ibid., p.61-2.

payments, for specific projects. Typically around three quarters²¹ of Commonwealth grants to states relate to projects on the National Land Transport Network.²² The Network consists of the most important roads and railway lines linking capital cities, major centres of commercial activity and/or intermodal transfer facilities. The Network, including additions and deletions, is determined under Commonwealth law by the relevant minister.

The Commonwealth also funds local government, both through specific programs such as Roads to Recovery and the Black Spot program (\$0.4 billion in 2014-15), and also through grants notionally tied to local roads, amounting to around \$1.1 billion in 2014-15. These grants are provided by the Commonwealth to the states according to historical shares, and allocated by the state grants commissions in line with their assessment of the relative needs of different councils.²³

While Commonwealth funding is important to the states, it constitutes a minority of their transport infrastructure funding, which in 2014-15 was \$13.8 billion. States' own spending comes from their GST allocations and from their own sources of revenue. It is common for a single piece of transport infrastructure to have both Commonwealth and state funding. When the Commonwealth provides funding to a state government, the expenditure is reported at both Commonwealth and state levels.

Commonwealth and state grants to local government account for only 15 per cent of local governments' revenue base.²⁴ Local governments are responsible for maintaining 80 per cent of the

road network, with road maintenance and construction generally their largest single spending responsibility.²⁵ As these roads are local, their primary role is to serve local communities and economies; as such, they are not the focus of this report.

1.5.1 Where does transport infrastructure spending go?

The question of how to allocate a given infrastructure budget is a separate but no less important question than how much to spend.

There are different ways of arguing the need for transport infrastructure. One argument is that transport infrastructure is most valuable when it supports the people who live and work in the main economic centres; this increases the prosperity of the community as a whole and the pool available for funding services and redistribution. This basis would be unlikely of itself to lead to similar levels of amenity across states; at its most extreme, it would mean most or all investment would be in the biggest few capitals.

A different rationale used to justify investment is equality of access across the country and across each state. There is an established process to determine what spending would be needed to achieve this. The Commonwealth Grants Commission analyses how much each state needs in order to provide the same services and infrastructure as other states. The result of this analysis determines what share of the GST pool goes to each state, and is updated each year. The states have their own grants commissions, which undertake the equivalent process at the state level to allocate funds among local councils.

²¹ Department of Infrastructure and Regional Development (unpublished)

²² For more details, see Appendix B.

²³ Local Government (Financial Assistance) Act (1995)

²⁴ Department of Prime Minister and Cabinet (2014), p.37

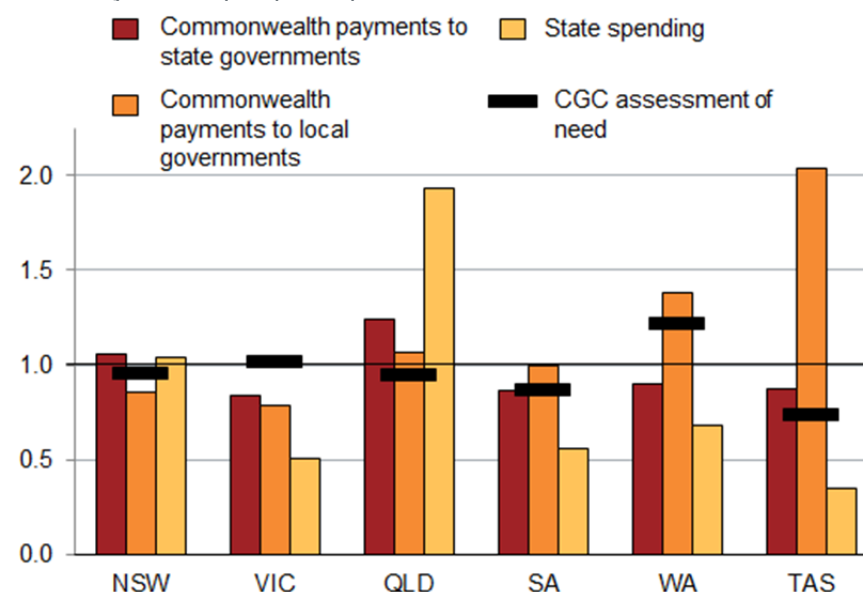
²⁵ Australian Local Government Association (2015), p.9

But equality of access considerations do not appear to have determined how spending was allocated over the past decade. The Commonwealth Grants Commission (CGC) itself commented that, *there is no relationship between State shares of the payments [for transport infrastructure] and the currently assessed State-based drivers of road and rail investment.*²⁶

Figure 1.3 shows each of the funding sources for each state, relative to a benchmark of equal need. Victoria and Western Australia have generally received much less from the Commonwealth than their assessed transport needs imply. Queensland and Tasmania have received much more, with Tasmanian state and local government receiving a combined contribution 50 per cent higher than their assessed need. The Queensland government has spent much more than its needs imply (a component of which is flood reconstruction) and Victoria and Western Australia have spent much less.

Figure 1.3: Differences between the states are not explained by a notion of states achieving equality of outcomes

Relativity to an equal-per-capita basis



Note: Commonwealth and State spending based on period 2005-06 to 2014-15. The CGC assessment estimates what amount states would need to invest during the 2013-14 year on roads and urban transport to provide the same services and infrastructure at the same standard as the national average. State spending excludes expenditure funded by Commonwealth payments to state governments.

Source: Grattan analysis of Commonwealth and State budget papers 2005-06 to 2014-15; ABS (2015a); Commonwealth Grants Commission (2015b); Department of Infrastructure and Regional Development (unpublished)

²⁶ Commonwealth Grants Commission (2015a), p.60

1.6 Who makes the decisions about what is spent?

Governments make most of the decisions about transport infrastructure investment, often fully or partially funding the investment. This is true of roads and public transport, although user charges fund the operation of Australia's ports, the four largest airports, and freight rail operations.²⁷ This situation has been in place historically and because of the market failures that apply to transport infrastructure.

Governments make these decisions on behalf of the electors they represent. Criticisms of transport infrastructure spending are often based on a view that governments make infrastructure spending decisions to assist certain groups of electors rather than the electorate as a whole.

There is growing interest in better ways of making transport infrastructure decisions using market-based approaches.²⁸ There are many possible models for introducing market discipline into transport infrastructure spending. Typically these approaches involve some form of user charging.

As noted in Section 1.3, user charging offers several compelling benefits, including that it would influence travel choices without prohibiting any specific trips, and would generate revenues that could be invested in transport services. A further reason is that user charges on any form of transport infrastructure can provide reliable information about where existing systems are under pressure and therefore where new capacity could be worthwhile. This information is not available at present.

²⁷Productivity Commission (2014), p.143. User charges for airport and port services are regulated to prevent monopolistic pricing.

²⁸Treasury (2010), Chapter E3; Productivity Commission (2014), p.141; Competition Policy Review (2015); Infrastructure Australia (2016a) , p.9.

Road user charging could involve the replacement of fuel excise, vehicle registration, driver license fees, and potentially other taxes such as stamp duties, taxes on third party insurance and car parking levies. Road user charges already operate in parts of the road network of several countries. Switzerland has adopted heavy vehicle charging across its national road network. Congestion charges operate in London, Stockholm, Singapore and Milan.²⁹

Community resistance is a barrier to market-based approaches, particularly road user charging. Many people fear a net increase in the taxes and charges they pay, that they would see little or no benefit, and that people on lower incomes might face prohibitive charges. It will be difficult to strike an acceptable balance between charging the costs of wear and tear, mitigating congestion and raising revenue. Detailed consideration of road user charging for the Australian context is beyond the scope of this analysis, and will be examined in a future Grattan Institute report.

²⁹Infrastructure Partnerships Australia (2014), p.41.

1.7 How are infrastructure spending decisions made?

The Commonwealth is supposed to focus on transport infrastructure that supports the national economy, or is important beyond a single state's borders. It is also concerned with infrastructure spending because it is responsible for macro economic management.³⁰ Over time, the Commonwealth's role has shifted in terms of whether it favours roads, public transport or is neutral between different modes.

In practice, the Commonwealth's deeper pockets have led it to go beyond infrastructure projects that are important to more than one state. In 2014-15, the Commonwealth provided a total of \$5.9 billion relative to the states' combined spending of \$13.8 billion. This means the Commonwealth has a substantial say in what is funded, although it relies upon the states to bring forward possible projects.

State governments have a broader responsibility to provide an integrated transport system that supports economic activity and growth while also providing a level of service and access for the whole community. Local governments own and maintain large stretches of road and numbers of bridges and airports.

There is a trade-off between capital outlays and maintenance costs over time, and how much responsibility each level of government has for each element. What is more, there is variation from one project to another in terms of which jurisdiction benefits most from fees and charges, with states benefiting from larger payroll, land and motor vehicle taxes and the Commonwealth from higher income taxes and fuel excise.

Ideally, potential projects are identified within a framework for transport and land use planning set out by a state department of infrastructure or transport. Large projects, such as WestConnex in Sydney and London's Crossrail tunnel, can have profound impacts on the development of cities, and can only develop in the context of a plan for the city as a whole.

Within such a framework, departments of transport plan, generate and develop options and put these options to a minister for endorsement. Sometimes a minister may ask the department to develop a proposal or options to meet a particular need. Departments prepare a business case on proposals. At that point, cost-benefit analysis is used to assess whether a proposal will deliver benefits to the community that exceed its costs, and to compare projects on a like-for-like basis (Box 2, and see Appendix A). The minister takes the endorsed proposals to cabinet for a decision about whether to proceed, which will often depend on the availability of a funding contribution from the Commonwealth. Funding for both state and Commonwealth governments is formally allocated through the annual budget process.

³⁰ Council on Federal Financial Relations (2011), schedule E, p.E-4,

Box 2: Cost-benefit analysis for transport project appraisals

Cost-benefit analysis is a widely used tool to assess whether a proposal will deliver benefits to the community that exceed its costs, and to compare projects on a like-for-like basis. Cost-benefit analysis aims to count, in monetary terms, all the benefits and costs of a new initiative to all members of society.

Cost-benefit analysis allows comparison of various projects, as well as design and implementation options for a given project and options for combining several projects. A positive net present value (benefit-cost ratio above one, or one plus a buffer) indicates that a project will provide net benefits to the community.

However, cost-benefit analysis is not without its limitations. First, there is often significant uncertainty about costs and benefits. Since most of the benefits of new transport infrastructure accrue to users, benefits estimates depend heavily on models projecting future usage over the life of the project. Estimating the lifetime costs of a project is particularly challenging when it involves new technologies.

Second, key assumptions used in cost-benefit analysis can have a large bearing on the results. For one, the results depend on the assumptions made about the base case where the initiative does not proceed. Similarly, the choice of discount rate can make a huge difference to the expected payoff from transport projects with costs and benefits spanning decades. While government bodies provide guidance on the appropriate discount rate to facilitate comparisons of proposals, where the rate should be pitched remains the subject of significant debate.

Third, the methodologies employed to estimate wider economic impacts (WEIs), such as agglomeration economies, improved

competition in imperfectly competitive markets and changes to labour markets remain very imprecise (Dobes and Leung (2015)).

Fourth, potential projects may result in significant social and environmental impacts, yet these can be difficult to estimate, and particularly difficult to express in monetary terms.

Finally, institutional factors can also matter. Project proponents sometimes 'strategically misrepresent' expected costs and demand levels to see a project proceed (Productivity Commission (2014)). A recent global study of more than 2,000 infrastructure projects concluded that cost-benefit analyses for large projects tend to overestimate cost-benefit ratios by between 50 and 200 per cent (Flyvbjerg and Sunstein (2015)). If adopted, the recommendations in this report would reduce such 'optimism bias' by clearly separating project proponents from those appraising potential projects.

Cost-benefit analysis does not include every relevant consideration. Australian practice is not to count the efficiency losses of increased taxation to fund projects, although this may need to change if governments proceed with every project where the benefits exceed the costs. In addition, it may be impractical to use cost-benefit analysis to compare all the potentially viable combinations of inter-related proposals to meet an identified need.

Ultimately, while the shortcomings of cost-benefit analysis are well documented, it remains the best tool available to support rigorous, like-for-like comparisons of potential projects. Together with strategic planning to identify potential initiatives that meet overall social, economic and environmental goals, and account for network effects in investment decisions, cost-benefit analysis should form the heart of the process for determining which projects get funded, and when.

1.8 Recent reforms to project selection processes are only a first step

Some jurisdictions have recently introduced an additional review stage to the project selection process. At the national level, Infrastructure Australia has operated in its current form since 2014. At the state level, Infrastructure NSW is the most established, having operated since 2011. Victoria, Queensland and Tasmania have also established review bodies in recent years (see Box 3).

These infrastructure advisory bodies are not decision-makers. They report through their boards to a minister. Some people argue that they *should* be decision-makers, usually out of a concern that projects are too often chosen for political reasons. However, while the concern is a reasonable one – and this report shows it is all too often justified – spending decisions should remain a core responsibility of elected governments.

Governments are elected to act on behalf of constituents, and delegating those decisions to technical experts would only be desirable if perfect evaluations of proposals were possible. A better approach is to improve the incentives for elected governments to act in the best interests of all constituents.

Box 3: Infrastructure advisory bodies

Infrastructure Australia was established in 2008 and substantially reconfigured in 2014. It is a statutory agency overseen by a board, appointed and able to be terminated by the minister. It advises the minister on infrastructure strategy, including the adequacy, capacity and condition of nationally significant infrastructure. It also evaluates proposals and develops lists of projects needed to meet Australia's infrastructure needs.

Infrastructure NSW is a similar statutory authority with a board appointed and able to be terminated by a minister. Set up in 2011, it has developed a 20-year strategy and five-year plans for state infrastructure, and it also reviews and evaluates project proposals.

By contrast, Victoria and Queensland have established infrastructure bodies with boards appointed and able to be terminated by Governor in Council, that is, by the state governor plus the cabinet. Both of these bodies have similar responsibilities to Infrastructure Australia and Infrastructure NSW. Tasmania is currently establishing Infrastructure Tasmania.

Source: Infrastructure Australia Act (2008), s.8 & s.18; Infrastructure New South Wales Act (2011), s.8 & Schedule 1, s.4; Infrastructure Victoria Act (2015), s.13 & s.15; Building Queensland Act (2015), s.25; Department of State Growth (2015), p.43.

Public servants who report to a minister understand that their job is to implement the platform and decisions of the minister.³¹ For as long as infrastructure advisory bodies report to a minister rather than the parliament, they will be constrained from providing advice that they know or anticipate may run counter to the views and preferences of the minister or government.

While the existing infrastructure advisory bodies could be valuable gatekeepers, this report argues the way they are currently constituted does not do enough to address the risk of wasteful infrastructure spending.

Infrastructure advisory bodies as currently constituted can be excluded altogether from evaluating proposals. Governments do not always ask infrastructure bodies about potential projects; often they will commit substantial amounts of public money without any evaluation of a project's merits. Of the projects that have started to receive Commonwealth funding since June 2012, 58 per cent of that funding, or \$3.7 billion, has been on projects that do not have a published project evaluation.³²

In some cases the bodies are consulted, but too late in the process. In the past five years, over \$2.6 billion of Commonwealth money has been committed to transport infrastructure projects

before the proposals were even submitted to Infrastructure Australia, much less evaluated.³³

More fundamentally, infrastructure advisory bodies are hampered because they do not have enough information to form an independent view of the overall benefits and costs of a proposal. Instead, they assess projects on the basis of what project promoters tell them. This limits the scrutiny of the merits of projects. Even with this limited scrutiny, two of the individual projects submitted by state governments over the past five years to Infrastructure Australia would have provided benefits less than their costs.³⁴

The establishment of infrastructure advisory bodies could be seen as a useful step, signaling that governments intend to make better decisions about infrastructure. But it is only the first step and more is needed.

³¹ This responsibility was explained by the head of the Victorian public service, for instance, by observing that “the role and duties of the public service do not extend to running its own agenda by repeatedly advising of other options it may prefer but that run counter to the government’s settled and stated position.” Victorian Auditor General (2015a), p.85.

³² Commonwealth reporting requirements commenced in 2011. This figure includes National Network Maintenance 2014-15. Department of Infrastructure and Regional Development (unpublished); Infrastructure Australia (2016d).

³³ Ibid.

³⁴ Ibid. As noted in Box 2 and Appendix A, even where projects are subject to proper appraisal, including detailed cost-benefit analysis, optimism bias can lead to overestimation of project benefits and underestimation of costs. Therefore projects with cost-benefit ratios only marginally above one are unlikely to deliver value for money.

2 Transport infrastructure needs are changing

2.1 Cities will drive Australia's future

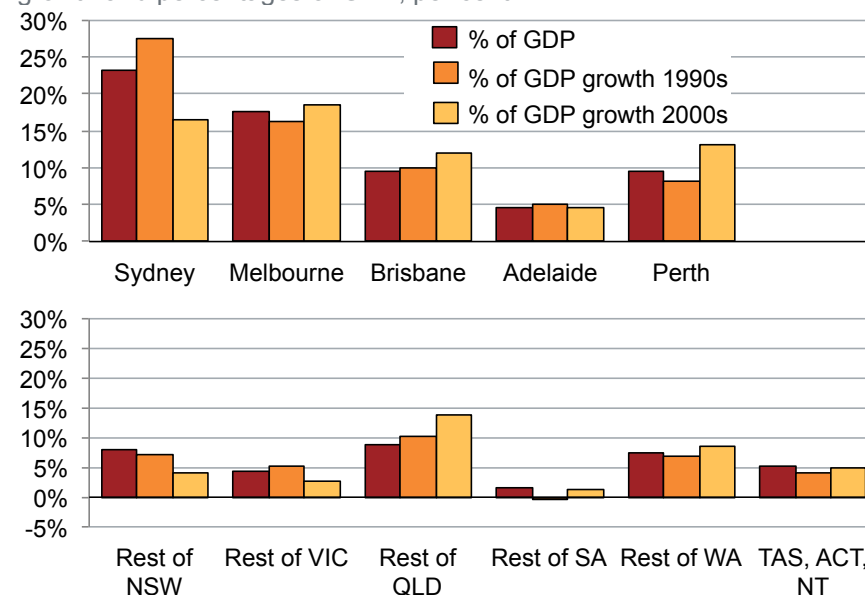
Most economic activity takes place in cities. Australia is highly urbanised by world standards, with the highest proportion of people in its two biggest cities of any country in the OECD.³⁵

Around 58 per cent of the population lives in Australia's four largest cities of Sydney, Melbourne, Brisbane and Perth,³⁶ and three quarters in a city of 90,000 or more.³⁷ Close to twice as many people work in state capitals as in regional or remote areas.³⁸ Around a quarter of these jobs are within 5km of the CBD, and around forty per cent are within 10km.³⁹

Even during the mining boom of the past decade, growth in GDP was concentrated in major capitals (Figure 2.1).

Figure 2.1: Even during the mining boom, most GDP and growth was in cities

Capital cities and regional areas of states, contribution to annual GDP growth and percentages of GDP, per cent



Notes: The percentage of GDP refers to 2014-15.

Source: SGS Economics & Planning (2015).

³⁵ OECD (2014), p.21

³⁶ ABS (2013)

³⁷ ABS (2015j)

³⁸ BITRE (2015a), p.52

³⁹ BITRE (2013), p.76

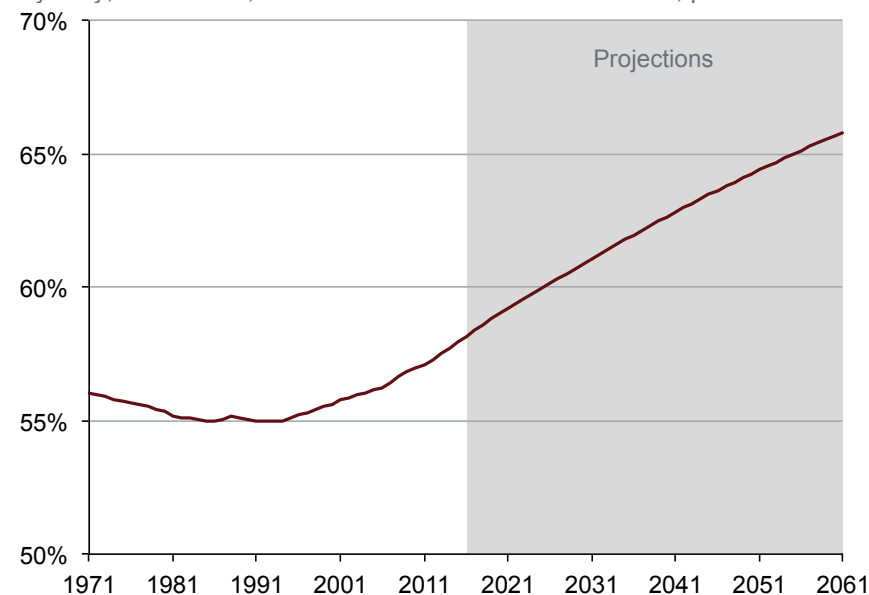
The density in cities of people and interactions, both economic and social, brings both advantages and challenges. On the positive side, cities offer more opportunities to share ideas, which both attracts skilled people and increases their skills once they arrive. The greater productivity of cities is reflected in higher wages, GDP and rates of innovation per person.⁴⁰ On the downside, the allure of cities also means more congestion, pollution and crime per capita.⁴¹

Governments' goal for transport should be to find ways to ensure that the positive aspects of cities outweigh their downsides. Infrastructure, particularly transport infrastructure, makes its biggest contribution to economic activity and income in the largest cities.⁴²

The trend to greater urbanisation is expected to continue.⁴³ Not only are most existing jobs in the cities, but so too are most new jobs, a consequence of the economy's long term shift away from manufacturing and agriculture to business and professional services. The biggest cities are projected to grow the most quickly (Figure 2.1).

Figure 2.2: The biggest four cities are projected to grow the most quickly

Historical & projected proportion of Australia's population in greater Sydney, Melbourne, Brisbane and Perth – 1971 to 2061, per cent



Note: Median (series B) projections reported.

Source: ABS (2015j); ABS (2013).

⁴⁰ Romer (2015)

⁴¹ Bettencourt and West (2010)

⁴² Infrastructure Australia (2015b), p.78, measured as direct economic contribution from infrastructure. Of this, transport infrastructure made 73 per cent of the total contribution.

⁴³ ABS (2015j)

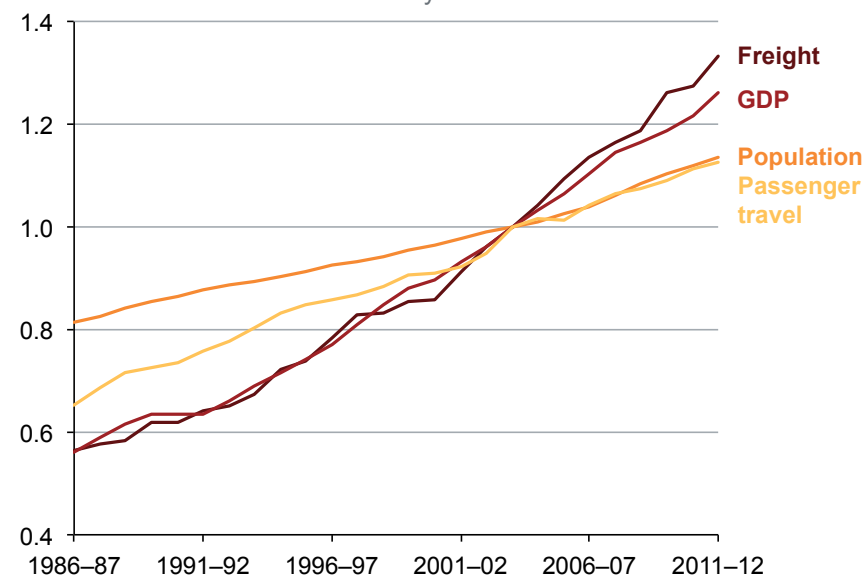
2.2 The transport task is changing

The size of the transport task is determined by how many people there are, how much demand each person places on the system, and the volume of exports. The demand that each person places on the system comes about not only through their own travel as a passenger, but also through their demand for freight, whether it is buying household items for their own use or attending a school or medical practice that needs consumables, buildings and staff to operate.

While the transport task as a whole is increasing with population growth, the nature of the task is changing. On the one hand, the distance that the average person travels has stabilised in recent years. After decades of growth, passenger travel per capita has not increased in the past decade.

On the other hand, freight volumes have risen at a consistently high rate over the past two decades. This has been driven partly by increasing imports as Australians became wealthier, with the average household's weekly disposable income rising from \$600 per week in 1994-95 to \$1,000 per week in 2013-14 in real terms.⁴⁴ More recently, freight volumes have increased even more sharply because of a 170 per cent growth in the volumes of freight carried by rail in Western Australia in the decade to 2009-10 – mainly iron ore to ports for export.⁴⁵ Freight volumes in other states have grown at a similar rate as GDP, of around 3 per cent per annum (Figure 2.3).⁴⁶

Figure 2.3: Aggregate passenger travel is driven by population growth while freight demand outstrips income growth
Index relative to 2003-04 financial year



Notes: Freight is volume, in tonne kilometres. Passenger travel is in passenger kilometres. GDP is the chain volume measure.

Source: BITRE (2014f), Table T 2.1c, p. 49, Table T 3.1a, p.59; ABS (2014a); ABS (2015a); ABS (2015b).

⁴⁴ ABS (2015g), equivalised

⁴⁵ BITRE (2014f), Table T2.2b, p.51, for the decade to 2009-10

⁴⁶ Ibid., Table T2.2d, p.52; ABS (2015b)

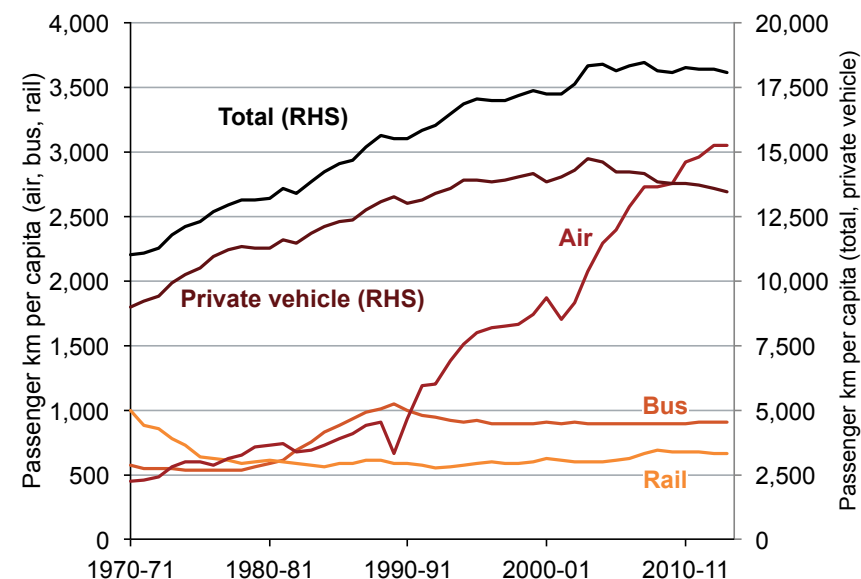
2.2.1 The amount of travel that people do has peaked

The frequency and length of trips per person increased markedly over the second half of the twentieth century. The total number of kilometres travelled by each person within Australia, on land and by air, rose dramatically from the 1970s (Figure 2.4). This was possible because incomes increased and the price of motor vehicles decreased.⁴⁷

Since 2004, this has changed. After decades of growth, average per person travel has flattened. This can be explained by natural limits on the amount of travel that people are willing or able to do.⁴⁸ In the case of car travel, the distance per person has declined since 2004, and fallen to levels last seen in 1993. A similar pattern is emerging elsewhere: ‘peak travel’ appears to be a consistent pattern across the developed world.⁴⁹

Figure 2.4: Australian per-capita car use has peaked

Australian per capita domestic passenger travel, by mode of transport, 1970-71 to 2013-14



Note: Private vehicle includes cars, as well as non-business use of light commercial vehicles (with small contributions from motorcycles, non-business use of trucks and ferries).

Source: BITRE (2015b), Table T 3.1, p.61; ABS (2014a).

⁴⁷ BITRE (2014d), p.3.

⁴⁸ Ibid.

⁴⁹ Ibid., p.4

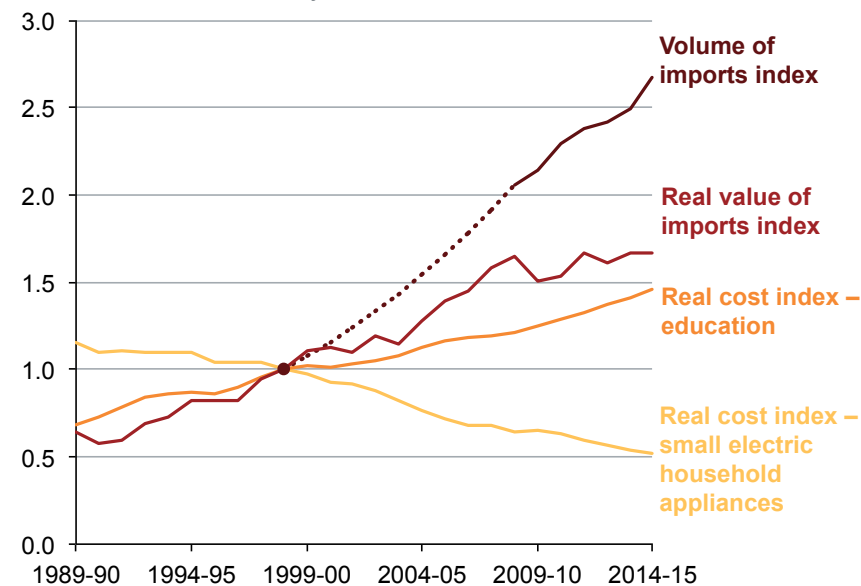
2.2.2 Freight demand continues to grow

As Australians became wealthier, our demand for goods increased strongly in the two decades to 2008. It shows no signs of slowing. Goods for Australian consumption are increasingly imported from overseas and handled through container ports and airports in capital cities.⁵⁰ This trend to imported goods is matched by the ongoing decline in Australian manufacturing, which has shrunk from over 25 per cent of GDP in the late 1950s⁵¹ to only seven per cent today.⁵²

Australians' greater demand for imported goods was boosted by a sharp fall in the price of many goods over the past few decades. In real terms, most goods cost around half what they did in the early 1990s. Figure 2.5 shows a fall in the real cost of small electric household appliances. Similar trends have been observed in the cost of major household appliances; clothing and footwear; and games, toys and hobbies. By contrast, the real costs of labour-intensive services like health care and education have increased. These now cost around 50 and 90 per cent more than in 1990.⁵³

However, the value of imports has stabilised since 2008-09, even though prices have continued to fall and volumes to rise. Regardless of whether this persists, it is clear that people can and do buy substantially more goods per head than they did a generation ago, and this additional demand is principally met by imports.

Figure 2.5: Goods are becoming cheaper and imports are growing
Index relative to 1998-99 year



Note: Real cost index is calculated as movement in CPI for a particular item adjusted for movement in overall CPI. Real value of imports index is calculated as the total nominal value of imports to Australia, adjusted by overall CPI. Data relating to the volume of imports is available for 1998-99 and each year from 2008-09 onwards. The dotted line represents one possible path over the period between 1998-99 and 2008-09. The index values for 1998-99 and 2008-09 onwards are known.

Source ABS (2015d), BITRE (2014a); ABS (2015h)

⁵⁰ BITRE (2014a), Table 4.13, p.71; BITRE (2014b), p.6-7

⁵¹ Productivity Commission (2003), p.XX

⁵² ABS (2015c)

⁵³ ABS (2015d)

2.2.3 Population growth may slow

The demand placed on transport infrastructure is strongly influenced by the size of the population and where people live.

Population increase occurs in two ways. Natural increase, or the number of births less the number of deaths, is relatively stable through the economic cycle. There was a marked increase in the Australian birth rate from 250,000 per year (roughly the same level for many decades) to 300,000 per year around 2006, which may have been driven by a faint second echo of the baby boom.⁵⁴

By contrast, net overseas migration – the number of people migrating to Australia, less the number leaving – is strongly influenced by the state of the economy (Figure 2.6). The desire of migrants to come to Australia and Australians' readiness to welcome them is closely linked to a strong economy and low unemployment.⁵⁵ Since unemployment started rising in 2008, net migration has declined in response to the slowing economy. In the past few years, net overseas migration has continued to drop, even as unemployment rates fall, perhaps because real incomes per capita have stagnated as the terms of trade have declined.

A slower rate of population increase may have dampened immediate pressures on transport infrastructure. However, in the longer term, Australia's population is expected to grow substantially. The 2015 Intergenerational Report projects that the population will reach 40 million by 2054-55, assuming that the number of net overseas migrants each year is 215,000.⁵⁶

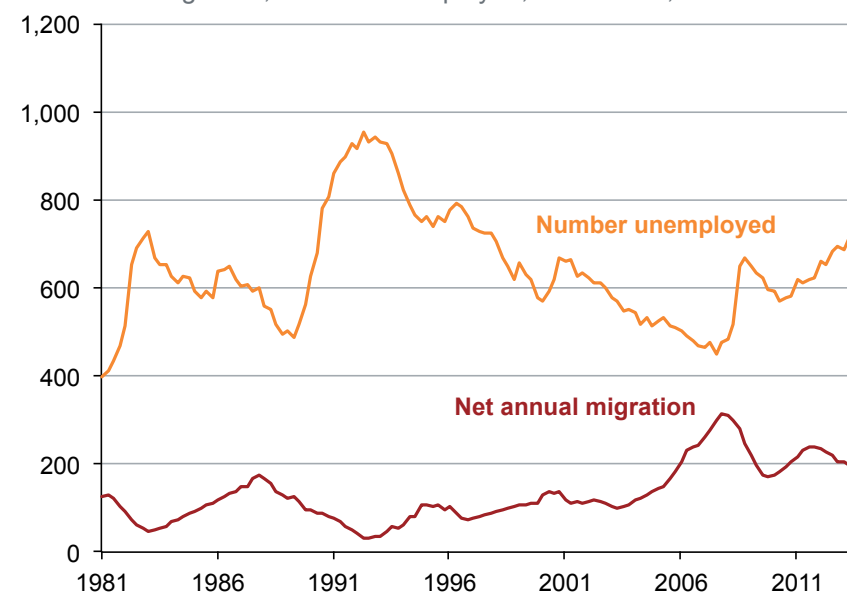
⁵⁴ ABS (2010), Appendix 5

⁵⁵ Markus (2015), p.36

⁵⁶ Central projection of the 2015 Intergenerational Report (Hockey (2015), p.3)

Figure 2.6: Population growth moves with the economic cycle

Net annual migration, number unemployed, thousands, 1981 to 2014



Notes: The rate of natural increase in population is relatively steady through the economic cycle.

Source: ABS (2015a); ABS (2015i)

However, recent trends suggest that the outcome may be lower than this (Figure 2.6).

Even if short-term demands on the transport system are milder than they have been in recent times, population growth over the longer term will create strong pressure both to make best use of infrastructure that already exists, and to add to the system's capacity.

2.2.4 Passengers and freight compete for city space

Even if passenger travel and household freight demand do no more than increase in line with population growth, competition for space on city transport networks will continue to grow.

The nature of passenger travel has changed over recent decades. Longer trips that used to be made by road or rail are now made by air. As a consequence, passenger volumes on most interstate highways have grown modestly in recent years,⁵⁷ while the task of getting urban passengers to and from airports is correspondingly more critical and more complex.

Because most freight enters Australia through container ports, generally located in capital cities, and much of that freight is delivered within the city where it lands, it is inevitable that freight vehicles increasingly compete for road and rail space with passenger traffic.⁵⁸

⁵⁷ BITRE (2014e), BTRE (2006), BITRE (unpublished)

⁵⁸ BITRE (2014b)

3 Investment has not focused on prosperity

In a country experiencing strong population growth, the need for new transport infrastructure will be strongest in the places where people are choosing to live. Improving the connections within the major economic centres also makes sense, for the benefit of the individuals and businesses operating in those areas, and also for the community as a whole.

This chapter examines the location and focus of government investment in transport infrastructure, and how well it has been directed to supporting key areas of population growth and economic activity.

3.1 The past decade's spend on transport infrastructure has been very high and uneven across states

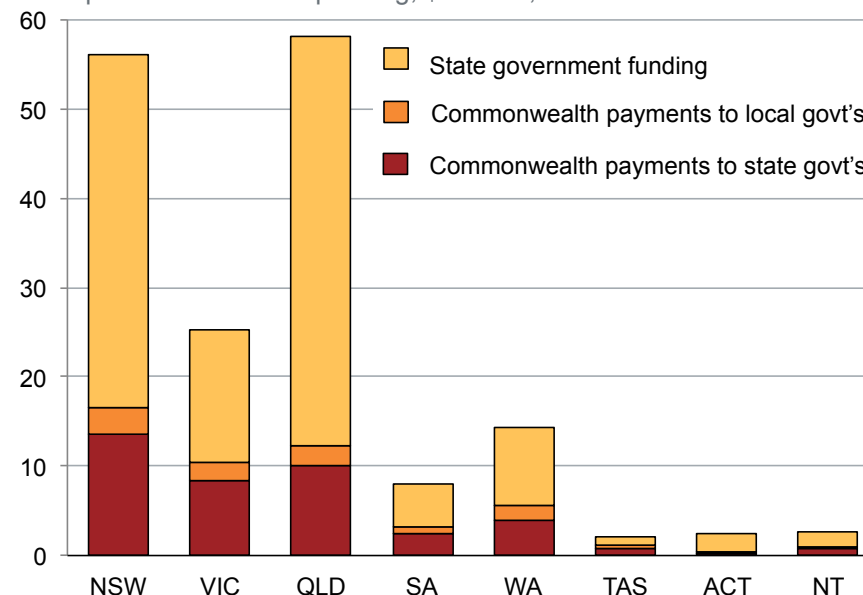
The Commonwealth spent an average of 1.5 per cent of its budget on transport infrastructure over the past decade, while the states spent around 6 per cent.⁵⁹ The states also spent more in absolute dollar terms than the Commonwealth (Figure 3.1).

Government spending grew at least as fast as GDP in all the larger states and at the Commonwealth level. Growth was particularly fast in Queensland and New South Wales, two states that account for much of the spending in excess of GDP growth over the decade.⁶⁰

⁵⁹ Transport infrastructure investment by the states (excluding payments from the Commonwealth) was equivalent to around 6 per cent of states' annual recurrent spending. Grattan analysis of Commonwealth, State and Territory budget papers 2005-06 to 2014-15 and ABS (2015f).

⁶⁰ Daley, *et al.* (2014)

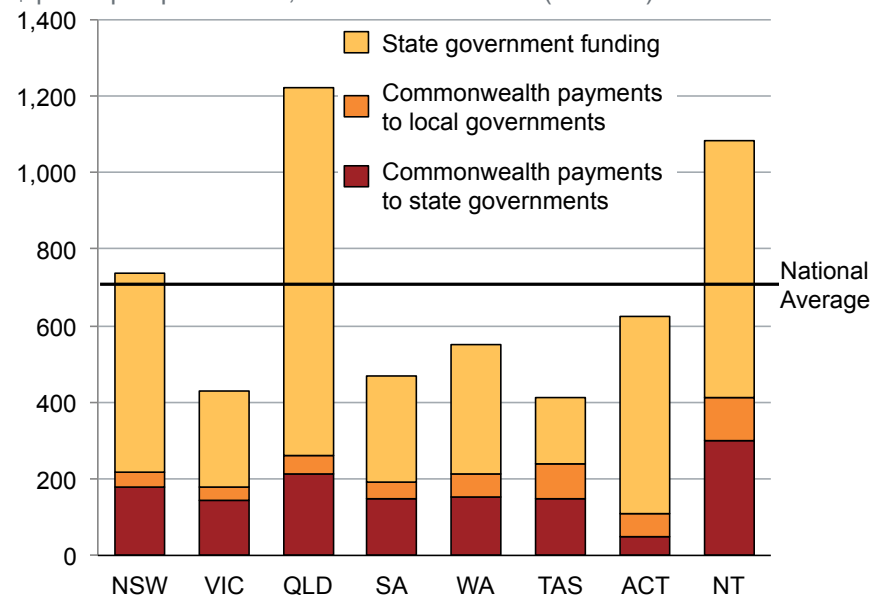
Figure 3.1: More has been spent on transport infrastructure in Queensland in the past decade than NSW, our most populous state
Transport infrastructure spending, \$ billions, 2005-06 to 2014-15



Source: Grattan analysis of Commonwealth, State and Territory budget papers 2005-06 to 2014-15; Department of Infrastructure and Regional Development (unpublished).

Figure 3.2: Commonwealth and state governments spent more per capita in NSW and QLD than in other states

\$ per capita per annum, 2005-06 to 2014-15 (nominal)



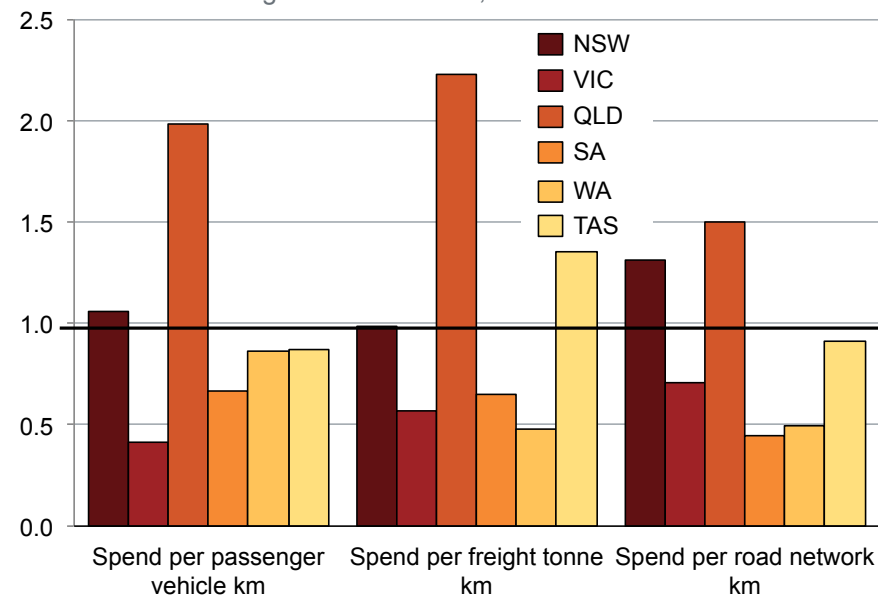
Source: Grattan analysis of Commonwealth, State and Territory budget papers 2005-06 to 2014-15; ABS (2015a); Department of Infrastructure and Regional Development (unpublished).

On a per capita basis, governments have spent substantially more in Queensland and NSW than in other states. This is true both of NSW and Queensland's own funding, and also for Commonwealth funding for specific projects (Figure 3.2).⁶¹

⁶¹ Grattan analysis of Commonwealth, State and Territory budget papers 2005-06 to 2014-15. These figures do not include private sector contributions to public private partnerships (PPPs). Around half of the total value of PPPs related to

Figure 3.3: Road investment is higher in Queensland based on any meaningful metric

Relative to the average across 6 states, 2005-06 to 2014-15



Notes: Passenger vehicle kilometres are based on the 12 months to 31 October 2014. Freight tonne kilometres are based on 2013-14. Road network kilometres are based on 2015.

Source: Grattan analysis of Commonwealth, State and Territory budget papers 2005-06 to 2014-15; ABS (2015k); BITRE (2015b), Table T1.6, p.44, Table T2.2a, p.52.

Road investment has been notably high in Queensland, both in passenger and freight terms, and not simply because Queensland has a larger road network.

Queensland projects, at an approximate value of \$17 billion. See Infrastructure Australia (2015c).

Rail investment has outstripped road investment in Sydney, and to a lesser extent Melbourne, over the past decade, due to several large projects in those cities.

3.2 Why has spending been so high?

Very high infrastructure spending could come about for several reasons:

- Supporting economic and population growth in large cities;
- Improving long-distance freight routes;
- Responding to major shocks, such as floods or economic shocks;
- Supporting the mining boom.

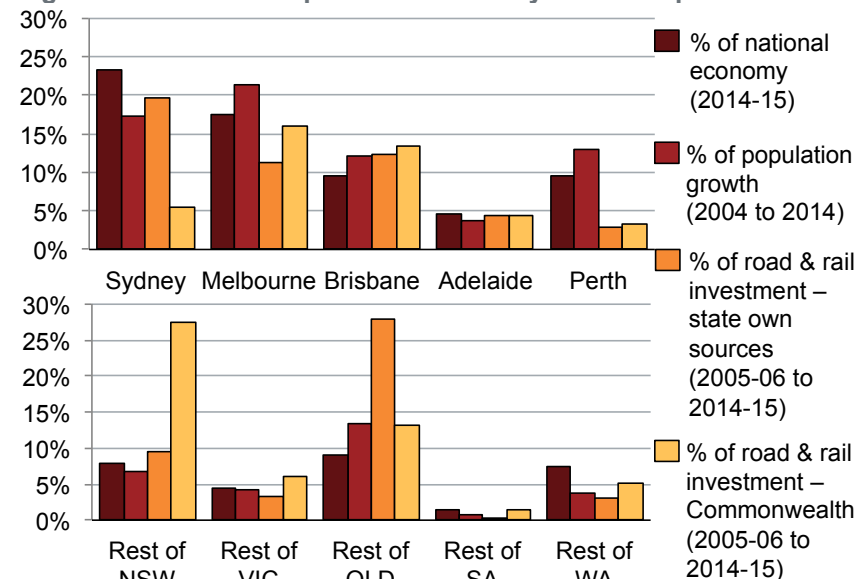
However, none of these considerations explain the disproportionate spending on regional roads, particularly in Queensland and New South Wales.

3.2.1 Supporting growth in large cities?

One might expect that transport infrastructure investment would reflect either existing economic activity, or the locations where people are moving, as noted in Section 1.5.1. The majority of economic activity in Australia occurs in the larger capital cities. Transport infrastructure is a critical enabler of the opportunities that come from a density of people, ideas and markets.

Given that most of the transport infrastructure that will be in operation for the foreseeable future already exists, one key determinant of where additions are most needed is where people are choosing to live. Obviously some areas will have a better stock of infrastructure than others.

Figure 3.4: More was spent in the country than in capital cities



Notes: Road and rail investment is over the 10 years from 2005-06 to 2014-15. Road and rail investment excludes private sector contributions to public-private partnerships. If included, the urban share of spending would be slightly higher. Source: Grattan analysis of Commonwealth and State budget papers 2005-06 to 2014-15; ABS (2015j); SGS Economics & Planning (2015); Department of Infrastructure and Regional Development (unpublished)

All other things being equal, one would expect new infrastructure to reflect areas of rapid population growth.

But neither bigger capitals nor faster growing cities appear to have been the impetus for choices about where to locate new infrastructure. Instead of concentrating new investment in large and fast growing Sydney, Melbourne, Brisbane and Perth, both Commonwealth and state governments spent disproportionately in country NSW and Queensland (Figure 3.4).

3.2.2 Improving long-distance freight routes?

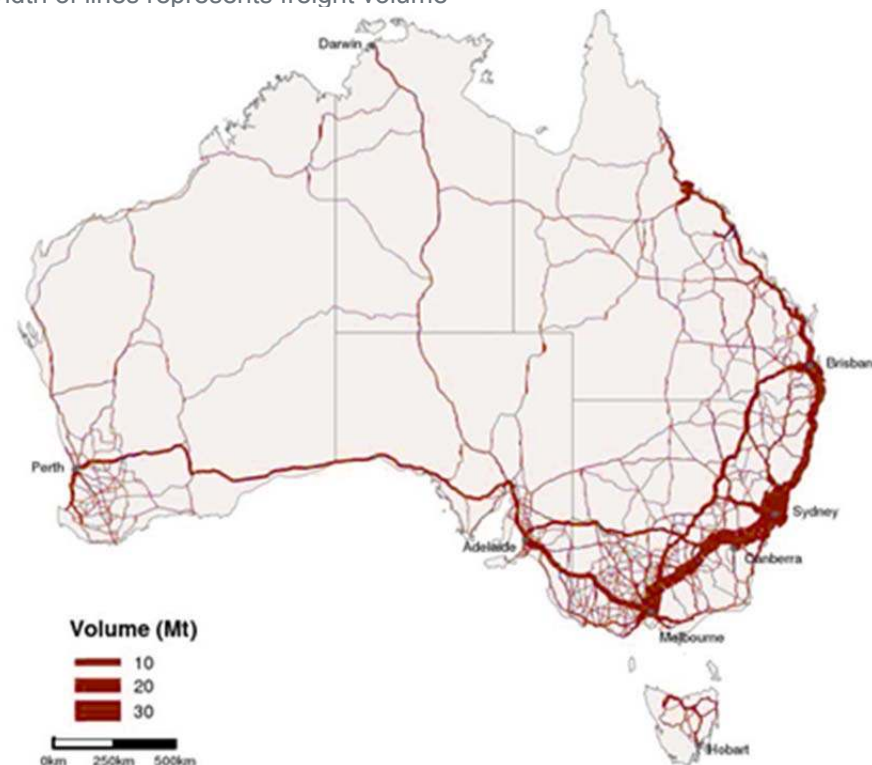
Land freight in Australia is dominated by the task of moving minerals from mines to ports for shipping overseas, and shifting imports from ports and airports to homes and businesses, mostly located in the cities.

The largest volumes are the movement of iron ore and coal. They are carried by bulk rail to specialised ports at Port Hedland, Dampier, Cape Lambert, Newcastle, Hay Point and Gladstone. Mining companies are the exclusive users of these facilities.

The remainder of Australia's land freight movement is dominated by road, which overshadows rail and coastal shipping along the eastern seaboard, especially the connections between Melbourne, Sydney and Brisbane (Figure 3.5).⁶²

Twenty per cent of road freight (measured in tonne kilometres) occurs within the four cities with major container ports: Sydney, Melbourne, Brisbane and Perth. A further 11 per cent is within other urban areas.⁶³ About 19 per cent is carried between capital cities. The remaining 50 per cent by volume is freight to or from non-capital cities, and includes agricultural exports. Intra-capital and inter-capital freight is probably a much larger proportion of total freight if measured by value rather than volume. Value statistics are not currently available.

Figure 3.5: Non-urban road freight task 2000-01
Width of lines represents freight volume



Source: BITRE (2014b)

As outlined in Section 2.2, many of the goods used in households and businesses are imported into capital cities by sea and air. These imports have become cheaper at the same time as Australian manufacturing has declined.

⁶² BITRE (2014b), p.3

⁶³ Ibid., p. 4

The only substantial rail route for non-bulk freight (that is, general freight, motor vehicles and food) is between Perth and the eastern states. This route accounts for three quarters of Australian non-bulk rail freight, as rail freight is only economic over longer distances.⁶⁴

Thus, overall, most freight (apart from bulk commodity minerals) is moved by road, and consequently this section focuses on road freight rather than rail.

3.2.3 Recent investment in roads has not focused on the overall freight task

Investment in new road capacity over the past decade has not been focused on the highways that carry most of the freight traffic. As shown in Figure 3.6, investment in new capacity – measured by the total capital spending per freight vehicle kilometre travelled over the past decade – has focused disproportionately on roads that account for comparatively small shares of freight traffic.⁶⁵

A number of regional road links on the National Land Transport Network have received much more funding per kilometre of traffic carried over the past decade than the national average (Figure 3.6). Spending per heavy vehicle kilometre has been particularly high over the past decade on the roads to Armidale and Dubbo in New South Wales, Bunbury in Western Australia, Colac in Victoria and Bell Bay in Tasmania.

⁶⁴ Ibid.

⁶⁵ The measure of heavy vehicle km reflects the fact that over 95 per cent of Australia's road freight by volume is carried in heavy vehicles that weigh 4.5 tonnes or more.

Neither is the high spending on some roads on the National Land Transport Network explained by passenger vehicle traffic. Roads with high levels of investment per heavy vehicle kilometre also had high investment per vehicle kilometres for all vehicles (Figure 3.6). This is not surprising, since passenger (or light) vehicle traffic tends to be a smaller proportion of total traffic volume on regional roads than on urban roads.

Several things stand out about roads spending on the National Land Transport Network in the past decade.⁶⁶

- At \$7.8 billion, new investment in the **Pacific Highway** far exceeds investment in any other road over the past decade. As the coastal route between Sydney to Brisbane, the Pacific is the second most important route for freight traffic (and most important route for all traffic). Recent strong spending may have reflected an attempt to redress historical under-investment in the Pacific Highway.⁶⁷ The quality of this road is assessed as lower than some other roads that carry significantly less traffic.⁶⁸

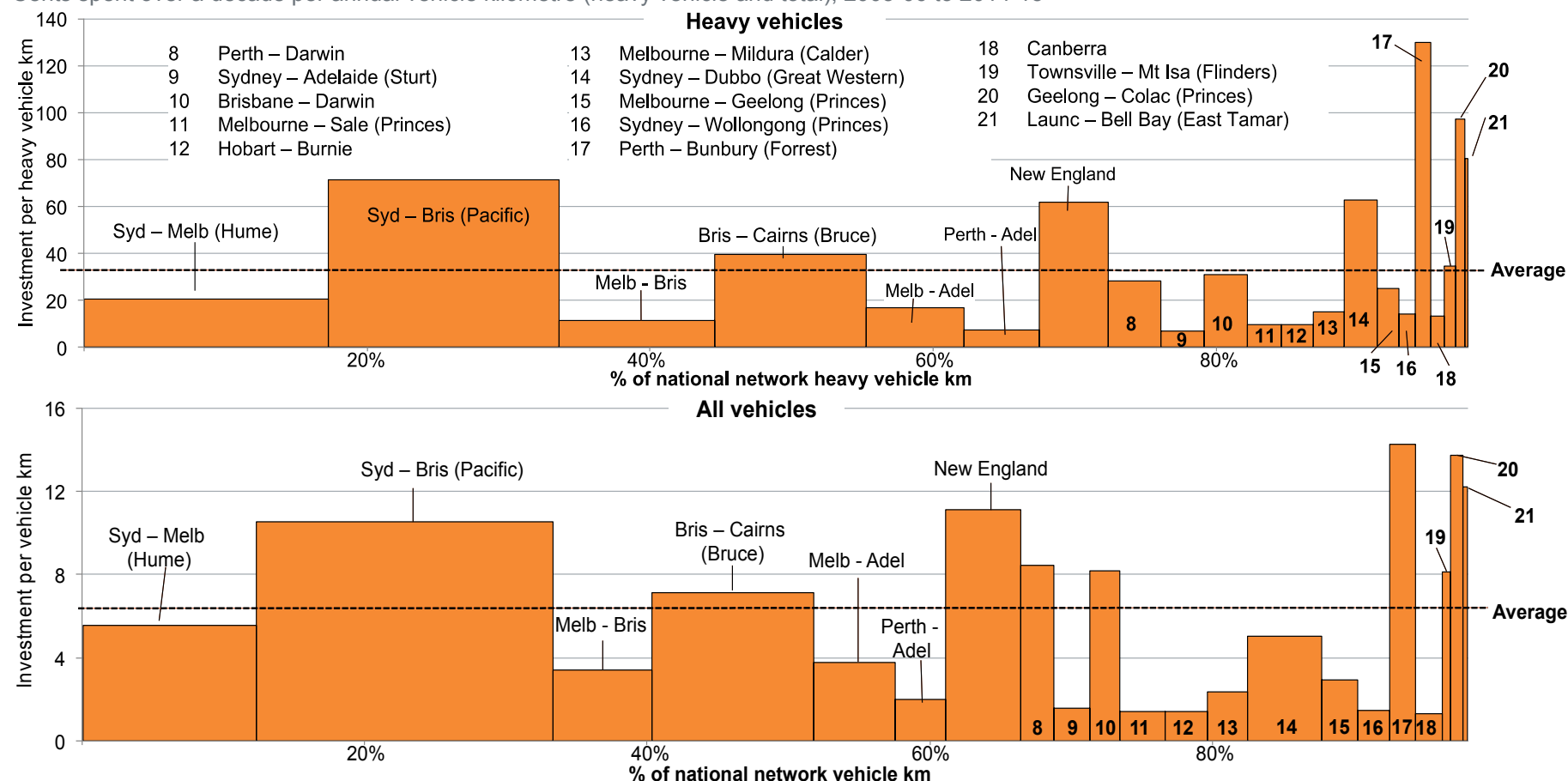
⁶⁶ For particular major highways (i.e. the Hume, Pacific, Newell, Bruce and New England Highways) a further five years of investment data was analysed to validate our results over a longer time period. Spending during the period 2000-01 to 2004-05 was generally much lower and this additional data did not materially impact our conclusions in this section and in section 4.3.

⁶⁷ Prior to 2005, the Pacific Highway was not included under National Highway legislation, as the New England Highway was historically the preferred Sydney-Brisbane route (National Land Transport Act (2005)).

⁶⁸ Ausrap star ratings collected by the Australian Automobile Association in 2013 give the Pacific Highway one of the lower safety ratings of roads on the National Network, despite having one of the highest traffic volumes (Australian Automobile Association (2013)).

Figure 3.6: Spending per heavy vehicle kilometre and per vehicle kilometre on non-urban roads on the National Land Transport Network

Cents spent over a decade per annual vehicle kilometre (heavy vehicle and total), 2005-06 to 2014-15



Source: Grattan analysis of Commonwealth, State and Territory budget papers 2005-06 to 2014-15; BITRE (2014e); BITRE (unpublished)

Notes: Each bar represents a specific stretch of road. For further details on route classifications, see Appendix B The height of the bar shows the total cents invested in the road per vehicle kilometre over the past decade. The width of the bar represents the vehicle kilometres travelled on the road in the 2011-12 financial year. Routes are sorted on the x-axis by total annual heavy vehicle kilometres travelled. The area of the bar represents the total amount invested in the road over the last decade The measure of heavy vehicle km reflects the fact that over 95 per cent of Australia's road freight by volume is carried in heavy vehicles that weigh 4.5 tonnes or more.

- While investment in the **Hume Highway** was below average for its freight volumes over the past decade, this highway rates strongly on measures of ride quality and safety. These ratings reflect significant investment prior to the past decade.⁶⁹
- The **Newell Highway**, from Melbourne to Brisbane, has had relatively little investment compared to other major highways over the past decade. The Newell carried 11 per cent of all heavy vehicle kilometres on the non-urban sections of the National Network; it received three per cent of the funding. The standard of the highway is low compared to the Pacific and Hume highways.
- Investment in the **Forrest Highway** from Perth to Bunbury was \$906 million over the past decade – much more than its share of freight traffic volumes. But population growth in Bunbury has been around double the national average over the past decade. The bulk of the investment relates to the Mandurah bypass, for which a 2009 Main Roads WA report estimated a benefit-cost ratio exceeding five.⁷⁰

Other roads that received funding above the average level include the New England Highway (the inland route from Sydney to Brisbane), the Princes Highway from Geelong to Colac and the East Tamar Highway from Launceston to Bell Bay. The reasons for the above average spending on these routes are explored as case studies in Section 4.3.

⁶⁹ The Hume Highway scores higher than comparable major roads in NSW and Victoria on measures of ride quality and safety for heavy vehicles collated by COAG in 2015, as well as on Ausrap star ratings collected by the Australian Automobile Association in 2013. COAG Transport and Infrastructure Council (2015); Australian Automobile Association (2013).

⁷⁰ Main Roads Western Australia (2015)

3.2.4 Addressing major external shocks?

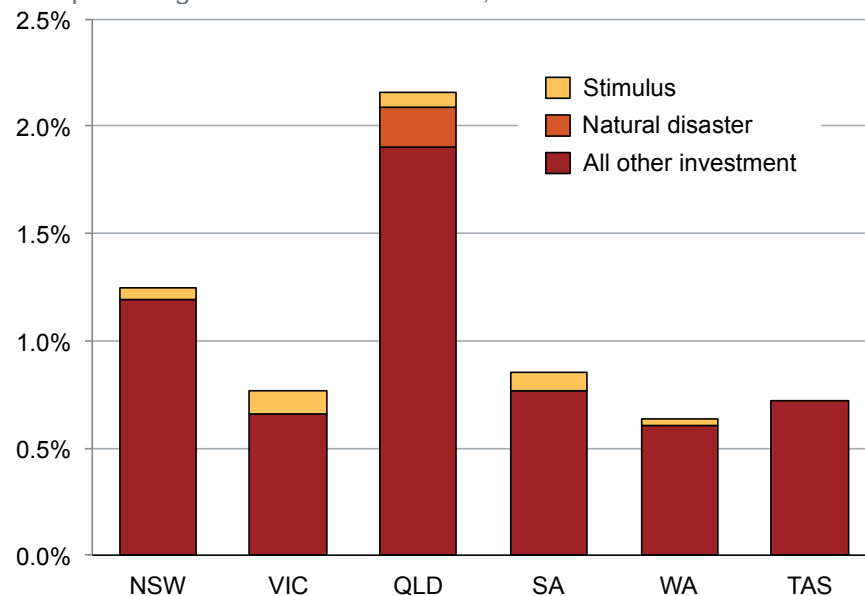
In the decade 2005-06 to 2014-15 two major external shocks affected infrastructure spending: the global financial crisis and the Queensland floods.

Both of these shocks led to higher spending by Commonwealth and state governments. The Commonwealth responded to the global financial crisis with substantial stimulus spending, including for transport infrastructure. It paid \$5.3 billion to the states for road and rail infrastructure between 2008-09 and 2011-12, and brought forward \$1.4 billion for roads in 2011-12 (with a corresponding decrease in 2012-13).⁷¹

⁷¹ Parliamentary Budget Office (2013), p.47

Figure 3.7: The Global Financial Crisis and Queensland floods explain only a small share of transport infrastructure spending

State government spending including transfers from the Commonwealth, as a percentage of Gross State Product, 2005-06 to 2014-15



Source: Grattan analysis of State budget papers 2005-06 to 2014-15; ABS (2014b).

Both Queensland and Commonwealth governments responded to the Queensland floods of 2010-11 with substantial investment in rebuilding of transport and other infrastructure.

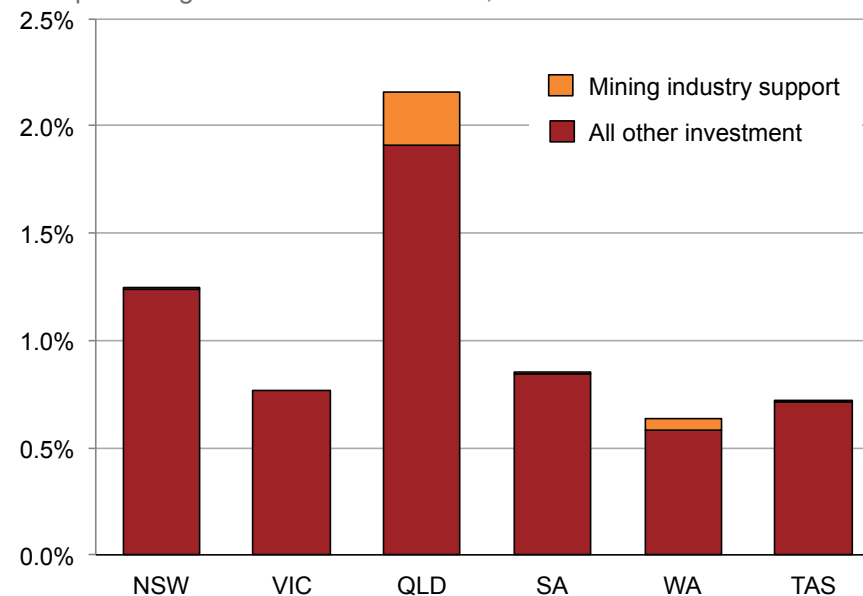
But these two events only explain a relatively minor part of the spending over the past decade (Figure 3.7).

3.2.5 Supporting the mining boom?

Of the spending in Queensland over the past decade, about 12 per cent can be explained by the state's investment in transport infrastructure for the mining industry (Figure 3.8).

Figure 3.8: Queensland spent more on transport infrastructure for the mining industry than Western Australia

State government spending including transfers from the Commonwealth, as a percentage of Gross State Product, 2005-06 to 2014-15



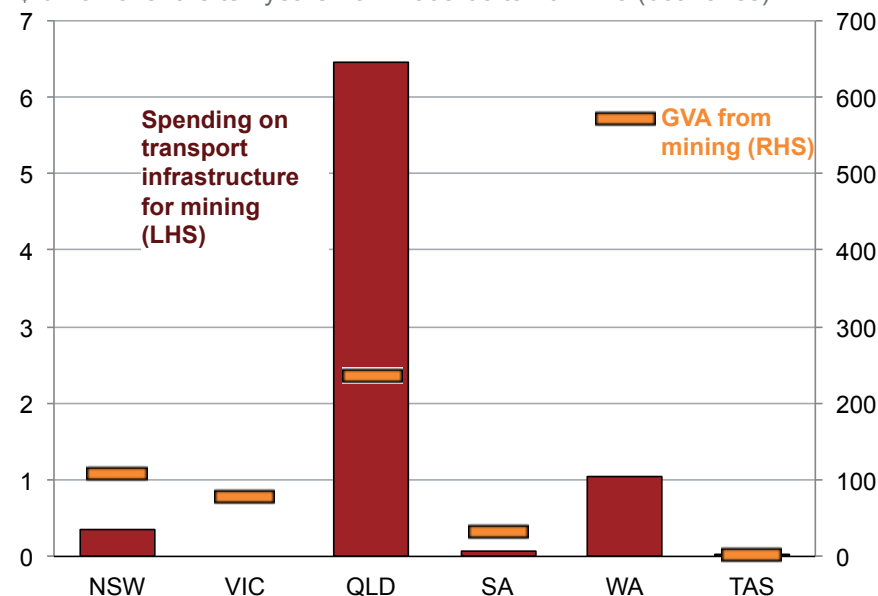
Source: Grattan analysis of State and Territory budget papers 2005-06 to 2014-15; ABS (2014b).

The Queensland government spent substantial sums on bulk railway and port facilities to get coal to export markets. This accounts for about 20 per cent of Queensland's infrastructure spend per capita in excess of other states'.

However, this government spending was not inevitable. Queensland's was not the biggest mining boom: over a decade, the mining industry produced more than twice as much value in Western Australia as in Queensland.

Some of the difference reflects the states' different resource bases. Queensland mainly produced coal and Western Australia mainly produced iron and other metal ores. Despite the greater value of minerals produced in Western Australia, the government in Western Australia spent far less on mining infrastructure than the Queensland government (Figure 3.9).

Figure 3.9: Government spending on transport infrastructure for mining, compared with gross value added from mining, by state
\$ billion over the ten years from 2005-06 to 2014-15 (both axes)



Note: State government spending including transfers from the Commonwealth
Source: Grattan analysis of State and Territory budget papers 2005-06 to 2014-15; ABS (2014b).

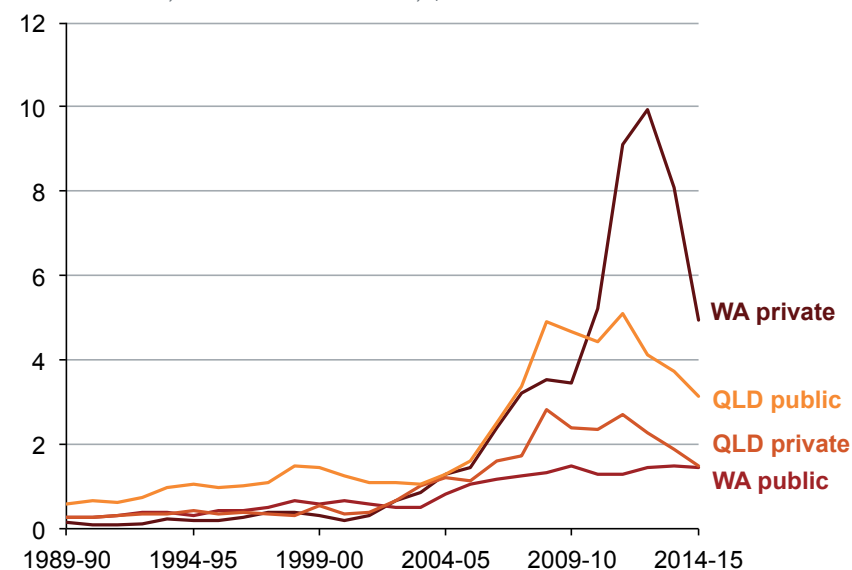
The essential difference lay in who paid for the infrastructure. In Western Australia, the private sector paid for much of the additional infrastructure required to carry commodities to market, while in Queensland, the state government provided far more substantial support (Figure 3.10). Thus the Western Australian and Queensland governments have adopted different approaches to providing specialised transport infrastructure for the mining boom.

When there are many users, it is more efficient to have a single provider of infrastructure than to have several providers running parallel networks of roads, railways or ports. Where there is a single user, private firms can make investment decisions as they see fit, to take advantage of commercial opportunities. Where there are a small number of exclusive users, it is usually better for government to leave users to make their own decisions about the costs and benefits of infrastructure investment.⁷²

In Queensland, government infrastructure spending has predominantly supported the mining of one commodity – coal – whereas in Western Australia, the infrastructure has served a variety of companies mining iron ore, gold, alumina, nickel, copper and zinc.⁷³ Of course, the Queensland government may recover some of the costs of this infrastructure through user charges.

Figure 3.10: In WA the private sector funded new transport infrastructure; in Queensland the government did

Value of engineering work done by private and public sector in transport infrastructure, 1989-90 to 2014-15, \$ billions



Notes: includes roads, highways and subdivisions; bridges, railways and harbours. "Private" refers to work done by the private sector for the private sector. "Public" refers to all work done for the public sector.

Source: ABS (2015e), tables 19 and 25

⁷² Productivity Commission (2014), p.60-62.

⁷³ Peel, *et al.* (2014), Appendix C.

4 Investment has served political goals

As shown in the previous chapter, the substantial additional spending on transport infrastructure in regional New South Wales and Queensland cannot be explained as supporting cities, the key centres of economic activity and population growth. Nor can it be adequately explained by investing in important long-distance freight routes, dealing with major shocks or the mining boom. Instead, as this chapter shows, the additional spend correlates tightly with swing seats in federal elections, both at a state level and in individual seats.

Given the lack of publicly available data, it is difficult to assess how well individual projects correspond to the public interest. But it is possible to look at the overall outcomes of the portfolio of choices across a decade. While there may be reasons for each individual project to be built, the broad view reveals systematic biases in favour of areas more likely to provide crucial votes in elections. Whereas the biases in spending in favour of regional New South Wales and Queensland could not be explained by the factors explored in the previous chapter, they do correlate well with marginal states from federal elections.

While the Commonwealth only funds about a third of infrastructure spending, its grants are often conditional on matched state funding. Consequently, Commonwealth infrastructure funding choices can dominate the allocation of overall government funding.

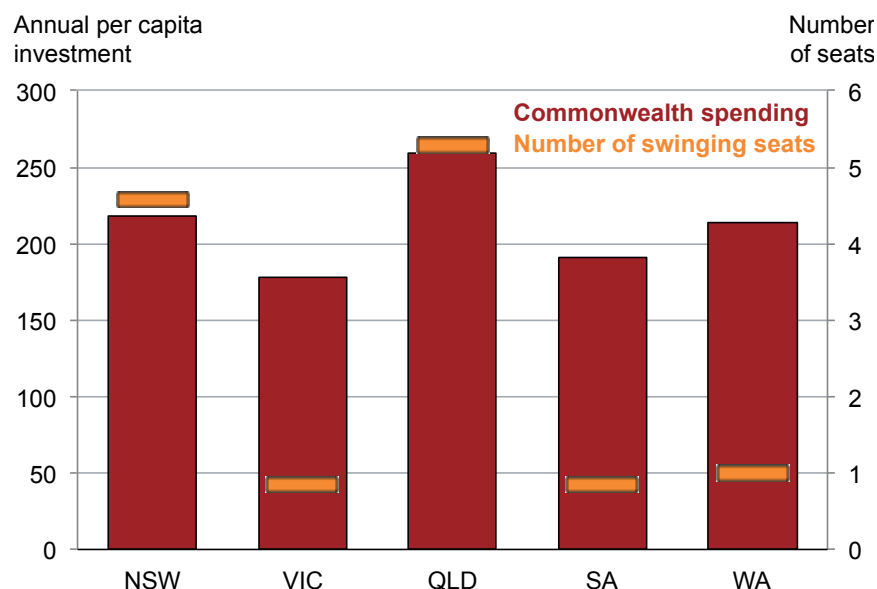
4.1 Swing states benefit most

Recent federal elections have been won and lost because a sizeable number of New South Wales and Queensland seats changed hands. In the past seven federal elections, one of the major parties gained an average of five seats from the other in each of New South Wales and Queensland. By comparison, Victoria has very little influence on federal election results, despite containing a similar number of seats to New South Wales and Queensland. Victoria has, on average, contributed only one seat to the swing in the past seven elections, and it never contributed more than three swing seats.

New South Wales and Queensland have also received more Commonwealth transport spending per capita than the other large states, particularly Victoria, over the past decade. The Commonwealth spent 46 per cent more per capita on transport infrastructure in Queensland than in Victoria (Figure 4.1).

Figure 4.1: The Commonwealth spends more on transport infrastructure per capita in swing states

Average annual per capita Commonwealth spending on transport infrastructure, 2005-06 to 2014-15, dollars
Average number of seats contributed to swing over the past seven federal elections (1996 to 2013)



Notes: Spending includes amounts paid directly to local government. The seats measure is the number of extra seats won in each state, by the party that made an overall gain at the election (i.e. Coalition 1996, 2001, 2004, 2010, 2013. Labor 1998, 2007).

Source: Grattan analysis of Commonwealth budget papers 2005-06 to 2014-15; AEC (2015); Department of Infrastructure and Regional Development (unpublished); ABS (2015a).

4.2 Swing states further benefit from special GST treatment

The GST redistribution methodology unravels the effects of Commonwealth decisions to fund more transport infrastructure in one state rather than another. The methodology reduces subsequent GST payments to a state that has received a disproportionate share of transport funding in previous years. In effect, the CGC recommends an end result as if the transport project funding were just added to the GST pool.

If this methodology was followed rigorously, individual states would not benefit financially from particular infrastructure decisions by the Commonwealth – although there is obviously a political advantage to the profile given to an individual project.

However, a new system has come into effect in recent years that modifies this redistribution,⁷⁴ reinstating the financial benefit of Commonwealth infrastructure spending in favour of New South Wales and Queensland. There are now two different treatments of Commonwealth transport infrastructure payments to the states. If the infrastructure is outside of the National Land Transport Network, any Commonwealth payments for infrastructure reduce that state's GST share, as has been the arrangement historically.

On the other hand, if the infrastructure forms part of the National Land Transport Network, half of the Commonwealth payment is quarantined from GST calculations. The other half is counted, and

⁷⁴ The 50 per cent discount has come into effect in stages. Since 2010, the Commonwealth Grants Commission has quarantined 50 per cent of payments for National Network roads projects from affecting GST shares. In the supplementary terms of reference for the 2015 review, the then Treasurer directed the Commission to quarantine 50 per cent of Commonwealth payments for seven specified roads from affecting GST shares. The Commission decided in that review to apply the same treatment to National Network rail as well.

reduces the state's share of GST over the following three years. This treatment came into effect for roads in 2010 and for rail in 2015. It provides a more favourable outcome for a state that receives a payment for National Network infrastructure. Payments by the Commonwealth to local government are fully exempted, and do not affect the GST shares.

This complexity makes a system where few – including politicians – can appreciate the real impact of decisions.

For example, Victoria received \$1.9 billion between 2012-13 and 2014-15 for the Regional Rail Link, which is not on the National Network. As a result, its GST payments for 2015-16 and the following two years would have totalled \$1.5 billion less, and the GST payments for other states and territories would have correspondingly been \$1.5 billion more.⁷⁵ If the project had have been part of the National Network, only \$0.95 billion⁷⁶ would have been redistributed from Victoria to the GST grants of other states.⁷⁷

Consequently, states only really receive a long-term advantage from Commonwealth funds for projects that are designated as part of the National Network. Over the past decade, these projects were even more skewed in favour of New South Wales and Queensland than total Commonwealth funding for transport infrastructure. Figure 4.2 shows the actual spending by the Commonwealth since 2011-12, and how the recently introduced GST distribution arrangements would operate on such spending once the arrangements are fully mature, in 2017-18.

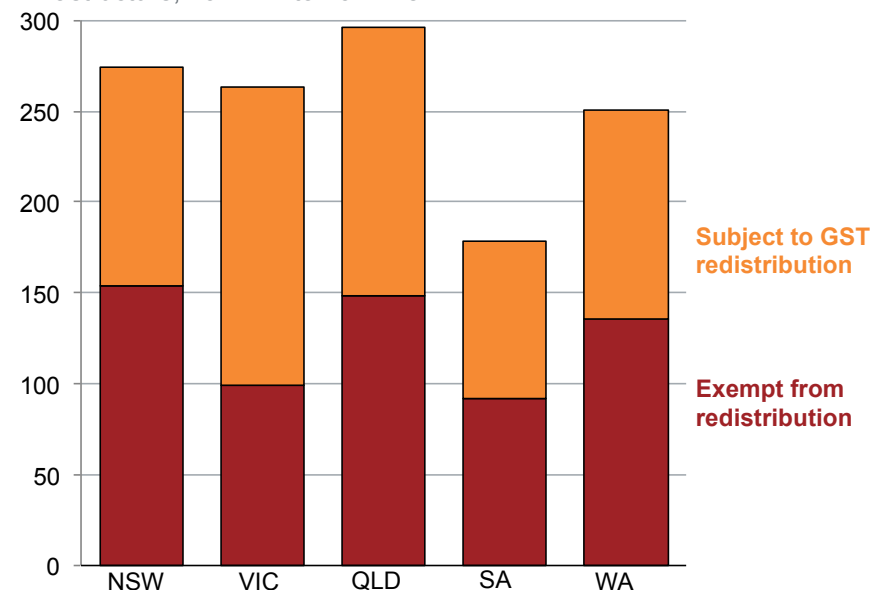
⁷⁵ The amount transferred is effectively 1 minus 22 per cent, Victoria's normal share of GST payments.

⁷⁶ That is, half of \$1.9 billion.

⁷⁷ Commonwealth Grants Commission (2015a), volume 1, p3

Under these arrangements, Victoria's below-average receipt of funds for National Network projects would cost the state around \$190 million a year, and South Australia's shortfall would be around \$67 million a year.

Figure 4.2: NSW and Queensland received more Commonwealth transport infrastructure funding in the favourable 'exempt' form
Average annual per capita Commonwealth spending on transport infrastructure, 2011-12 to 2014-15



Notes: The 'exempt from distribution' amount is calculated as 50 per cent of National Network payments plus all payments to local governments. This analysis examines the way the 2015 method would have affected GST shares if the new treatment had been established in 2013.

Source: Grattan analysis of Commonwealth budget papers 2005-06 to 2014-15; Department of Infrastructure and Regional Development (unpublished).

The special treatment of spending on the National Network is hard to justify. Some roads and rail lines on the National Network are certainly important, but others in fact carry very little freight or passenger traffic.

A better, more transparent, approach would be to treat Commonwealth transport infrastructure payments to the states consistently, whether by fully including them or fully exempting them from calculations of GST shares.

Fully including them, which was the old approach, makes sense if the Commonwealth's decisions are considered to be biased by electoral rather than economic or social criteria, as, indeed, appears to have been the case over the past decade. This treatment means that no state ultimately gets more than its fair share, in terms of being able to provide better levels of amenity than another.

Of course, given the Commonwealth's role in supporting transport infrastructure for economic growth of the nation as a whole, a much better approach would be to improve the basis of the Commonwealth's decisions, and then to take the transport infrastructure decisions out of the GST allocation pool, so that those decisions stick.

4.3 Marginal seats benefit most of all

Some electorates at the Commonwealth and state levels are particularly important at election time.

The bias towards projects in states with more swinging seats is a consequence of electoral politics. Promises of transport infrastructure are common in the lead-up to elections, and are made by governments and oppositions at both Commonwealth

and state levels. These promises are often for under-developed proposals that do not necessarily represent good public investment. Once a government is elected, its campaign promises form part of the agenda, and the public service is charged with implementing the ideas and, at times, back-casting the business case to support the decision to invest.⁷⁸

There is nothing new about politicians using infrastructure spending promises to attract voters, as Bert Kelly, the federal member for Wakefield said in 1961:

*I tried to point this out to the government before they committed themselves to building the big dam on the Ord, but there was an election looming and at each election I can feel a dam coming on.*⁷⁹

But the practice of promising projects on the basis of 'back-of-the-envelope' costings should not be the default mechanism of transport infrastructure planning.

In the middle of the past decade, the Auditor General examined AusLink (the National Land Transport Network), and found that:

it has become common for funding commitments for major roads projects to be made in the context of Federal Election campaigns. Many of the election commitment projects announced in the [] 2007 campaign were at an early stage of development such that robust project proposals (including the likely delivery timeframe and expected cost) had not been developed. This was compounded by the aggregate cost of the

⁷⁸ Australian National Audit Office (2009); Productivity Commission (2014), p.68

⁷⁹ Kelly (2011)

project announcements made by each of the Coalition and the ALP exceeding the amount of available AusLink 2 funding.⁸⁰

The remainder of this section comprises case studies of five projects that have received significant funding over the past decade. These are:

1. East-West Link (Victoria)
2. Canberra Light Rail (ACT)
3. Colac to Geelong road (Victoria)
4. Bell Bay to Launceston road (Tasmania)
5. New England Highway (NSW / Queensland)

The first case study, on Victoria's controversial East-West Link, saw substantial funding committed by both the Victorian and Commonwealth Governments, before being cancelled prior to construction.

The second case study explores how the ACT Government opted for a more expensive solution (light rail), when cost-benefit analysis showed a cheaper option (bus rapid transit) would have delivered similar benefits at half the cost.

The remaining three case studies investigate costly upgrades to roads with relatively low traffic volumes. These three roads are all within, or close to, swing federal electorates that have changed hands in recent elections: Corangamite (Colac to Geelong), Bass (Bell Bay to Launceston) and New England (New England Highway). As these case studies show, political considerations

were clearly a factor in decisions to spend Commonwealth money in these areas.

Case Study 1: East West Link (Victoria)

East West Link was a road proposed in 2008 to improve traffic flows on the east-west axis across Melbourne, bypassing the city centre. It was one of the largest transport infrastructure projects proposed in Australia, and was highly contentious on financial, economic and environmental grounds. The project has now been terminated.

Eastern section

In May 2013, the former Victorian Coalition government announced plans to start with the eastern section of East West Link. The original 2008 plan for the road identified the western section as the most pressing need; the decision to start instead on the eastern section likely reflects electoral considerations, given the importance of electorates in Melbourne's east (Figure 4.3).

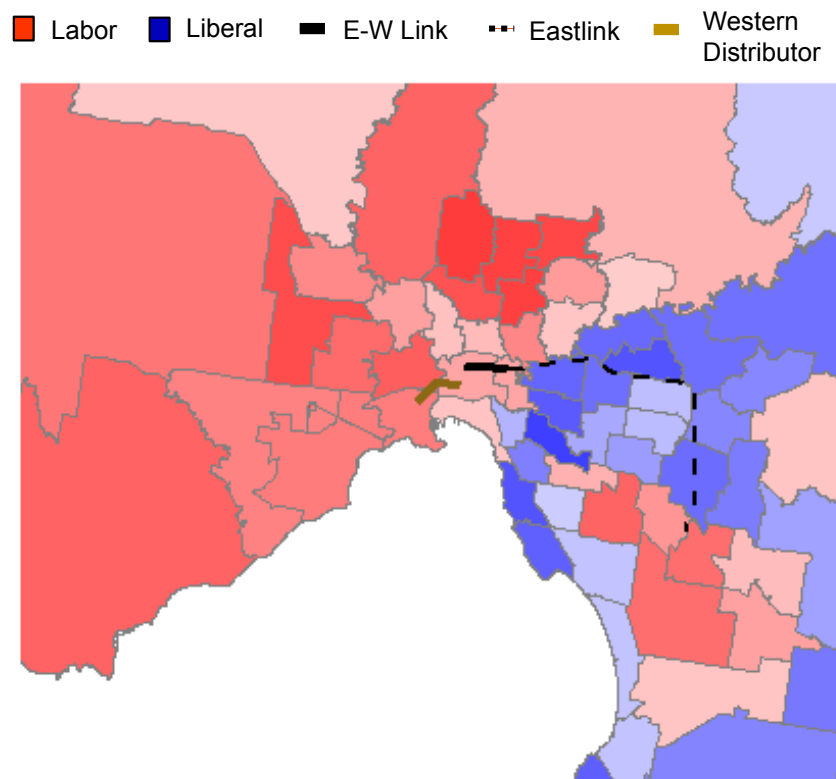
At the Commonwealth level, the Coalition promised to provide \$1.5 billion during the 2013 election campaign, and committed these funds in the 2014 budget for stage one of the project. A further \$1.5 billion was committed towards stage two in response to funding requests made by the then Coalition government in Victoria in early 2014. On 30 June 2014, just before the end of the financial year, \$500 million of the stage one funding and \$1 billion of the stage two funding was paid to Victoria.

The Commonwealth Auditor General investigated the Commonwealth Government's role, and found that very substantial amounts of funding were approved '*before the project*

⁸⁰Australian National Audit Office (2009), p.17

*had proceeded through the processes established to assess the merits of nationally significant infrastructure investments.*⁸¹

Figure 4.3: Melbourne electorates are divided along east-west lines
State districts by winning party, 2010 election



Source: Victorian Electoral Commission (2010)

⁸¹ ANAO (2015), p.20

He particularly noted that Infrastructure Australia had unanswered questions about the business case, that legal processes did not appear to have been followed for these very substantial amounts of money, and that the \$500 million payment was in advance of cash flow needs.

The Commonwealth Auditor General observed that ‘support for the East West Link project was a point of difference between the major political parties in the lead up to the 29 November 2014 Victorian state election.’⁸²

The East West Link project has also been assessed by the Victorian Auditor General, who found that:⁸³

Key decisions during the project planning, development and procurement phases were driven by an overriding sense of urgency to sign the contract before the November 2014 state election. The significant risks arising from this situation were further compounded by legal challenges to the project...

The risks were increased when the state agreed to amend the contract to provide additional compensation to East West Consortium if the legal challenge to the project planning approval succeeded. The available evidence suggests that the state knew at the time that there was a significant risk that this would happen.

Western section

Upon election, the new Victorian Labor Government terminated East West Link (eastern section), fulfilling a campaign

⁸² Ibid., p.7

⁸³ Victorian Auditor General (2015a), Audit summary, p.X

commitment to do so. It has since committed to an alternative proposal to East West Link (western section) – the Western Distributor, a project proposed as an unsolicited bid by private operator Transurban, at a cost of \$5.5 billion.⁸⁴

The government has established a new advisory body, Infrastructure Victoria, to provide expert advice on such proposals, but it has not done so in time for Infrastructure Victoria to scrutinise and advise on Transurban's proposal.⁸⁵

Case Study 2: Canberra Light Rail

In February 2016, the ACT government announced the successful bidder to build the first stage of Canberra's light rail network. The network will include 12km of light rail track and 13 stops, with operations due to begin in 2019.

According to the ACT Government's submission to Infrastructure Australia in 2012, the light rail network will deliver similar benefits to bus rapid transit, but at over twice the cost.⁸⁶ The benefit-cost ratio for light rail was estimated at 1.02, whereas for bus rapid transit it was 1.98. On this basis, the ACT Government's submission found that bus rapid transit would deliver higher

economic returns than the economically marginal light rail proposal.

The ACT Government subsequently decided to proceed with the light rail proposal, without a valid explanation for why it chose a project that its own analysis suggested was not the best option available.

Light rail was a key element of the parliamentary agreement that returned the Labor government with the support of Greens MLA Shane Rattenbury.⁸⁷

The business case for Canberra light rail, published in 2014, reported an estimated business cost ratio of 1.2. However, land use benefits and wider economic impacts, which are typically excluded from project evaluations by Infrastructure Australia because the risks of overestimating them are so high, account for almost three fifths of the projected benefits.⁸⁸ If these land use benefits and wider economic impacts are excluded, the benefit-cost ratio is just 0.5 – well below the level needed to deliver a net benefit to the community.

This example demonstrates the need to undertake cost-benefit analysis with care using consistent methodologies to ensure true like-for-like comparisons of potential projects (see Appendix A).

⁸⁴ Victorian State Government (2015a); Victorian State Government (2015b), p.3

⁸⁵ The business case for the Western Distributor was being assessed at time of writing by Infrastructure Australia as an 'initiative'; that is, a priority identified to address a nationally significant need, but requiring further development and rigorous assessment to determine and evaluate the most appropriate option for delivery (Infrastructure Australia (2016a)).

⁸⁶ The ACT Government estimated light rail would produce discounted net benefits of \$10.8 billion, while bus rapid transit would achieve similar benefits at half the cost, producing discounted net-benefits of \$243.3 million (Government (2012), p.29)

⁸⁷ Parliamentary Agreement for the 8th Legislative Assembly for the Australian Capital Territory (2012)

⁸⁸ The business case reports net benefits of \$823 million in present value terms, of which \$406 million is transport benefits, \$381 million is land use benefits, and \$198 million is for wider economic impacts. Capital Metro (2014), p.103.

Case study 3: Colac to Geelong (Victoria)

An 89-kilometre stretch of the Princes Highway forms a spur from Geelong to the town of Colac in Victoria. This road was added to the National Network in 2009.

The road to Colac is a curious inclusion on the National Network. This road does not meet the required legislative condition of connecting two important hubs, whether capital cities, major centres of commercial activity or inter-modal transfer facilities.⁸⁹ While Geelong is an important centre of commercial activity, it's hard to see how Colac, with a population of 11,939 and no heavy industry, could qualify as a transport hub or commercial centre. While some traffic from beyond Colac uses this section of road in transporting freight to Melbourne, its total use, measured as vehicle kilometres, is much lower than most other National Land Transport Network roads.

Over the past decade, the investment in the road to Colac has been among the highest per vehicle kilometre of any road on the National Network (Figure 3.6). Between 2005-06 and 2014-15, \$438 million was spent on this road, with 89 per cent of the expenditure occurring in the six years after 2009 when the road was added to the National Network. The quality of the road is high compared to other roads on the National Network, including roads that carry much more traffic.⁹⁰

Notwithstanding this very high level of investment for this road, the Commonwealth Government has committed a further \$185.5 million to duplicate the last 38 kilometres of the road to Colac.⁹¹ The benefit cost ratio assessed by VicRoads for this latest project was an exceptionally low 0.08:1. In other words, for every dollar spent the project will return only 8 cents – well short of a break-even point, let alone a net benefit to the community.⁹² The Commonwealth agreed to fund the road in the 2014-15 budget, in advance of Infrastructure Australia's assessment – which subsequently ruled that the proposal is not a priority.

The road to Colac lies in the Federal division of Corangamite. This once-safe Liberal seat has become increasingly marginal, and was won by the ALP in 2007 for the first time since the 1930s. It was the most marginal seat in the country after the 2010 election; it reverted to the Liberal party in the 2013 election.

The Geelong region is also a battleground in state politics.⁹³ Enhancements to the Geelong – Colac road, particularly sections 4A and 4B of the Geelong Ring Road, have been prominent in state elections for the seats of South Barwon, which changed hands in 2002 and 2010, and Geelong, which has been held by one party since 1999 with varying margins.

⁸⁹ National Land Transport Act (2014a), Part 2, Division 5.

⁹⁰ This road is rated well by both the Heavy Vehicle Infrastructure ratings collected for the COAG Transport and Infrastructure Council and published in 2015 and Ausrap star ratings collected by the Australian Automobile Association in 2013.

⁹¹ Treasury (2014)

⁹² Infrastructure Australia (2015a)

⁹³ For example, see Tomazin (2006); Ker (2006); ABC News (2006).

Case Study 4: Bell Bay to Launceston (Tasmania)

Over the past ten years, the Commonwealth and Tasmanian governments have spent \$265 million on the state's two National Network roads. One road is the Midland and Bass Highway, which connects Tasmania's two largest urban centres with each other and with the Port of Burnie. Governments combined spent \$150 million on this road over the past decade.

The other road is the East Tamar Highway. This road forms a spur out from Launceston to Bell Bay, and it received \$114 million in government funding over the past decade. This National Network road links the Bell Bay industrial estate, the site of two smelters and a power station, to Tasmania's third largest port.⁹⁴ Traffic volumes, including trucks, on the East Tamar Highway are much lower than those on the other state highway that forms part of the National Network. Yet spending per vehicle kilometre and per heavy vehicle kilometre has been far higher for this road than for the highway linking the north of Tasmania with the south (Figure 4.4). The East Tamar Highway also has a much higher safety rating than the Midland Bass Highway, despite its much lower traffic volumes.⁹⁵

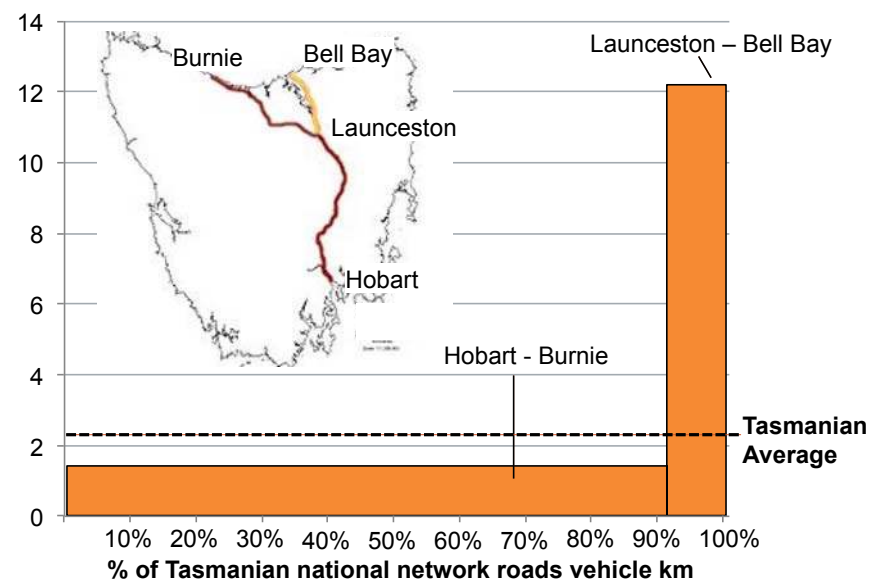
How to explain this anomaly? Bell Bay was intended to be the site for a proposed pulp mill, to be operated by the company Gunns Limited in the Tamar Valley. The pulp mill has not gone ahead, and Gunns has been in administration since September 2012.

⁹⁴ Tasmanian Department of Infrastructure (2013), pp.6-7

⁹⁵ Based on assessments by the Australian Automobile Association in 2013, half of the length of the East Tamar Highway has a three-star or better rating, while less than a quarter of the Midland and Bass Highways has this favourable safety rating. Almost the entire length of the East Tamar Highway has a two-star or better rating, compared to three quarters of the Midland and Bass Highways.

Figure 4.4: Spending per vehicle kilometre on Tasmanian National Land Transport Network highways

Spending per vehicle kilometre on National Land Transport Network highways in Tasmania, 2005-06 to 2014-15, cents



Source: Grattan analysis of State and Territory budget papers 2005-06 to 2014-15; BITRE (2014e); BITRE (unpublished).

A large company in a relatively small economy, Gunns exerted considerable political influence in Tasmania for many years, and close relationships with both parties at different times have been well documented.⁹⁶

⁹⁶ For example, see Darby (2010); TasmanianTimes.com (2006); ABC News (2008).

Case Study 5: New England Highway (NSW and Queensland)

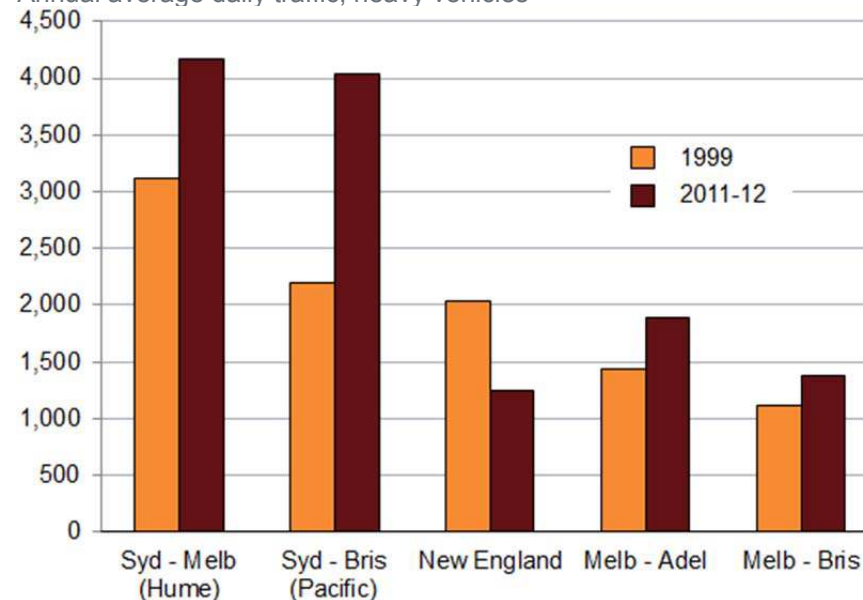
Over the past ten years, the Commonwealth, New South Wales and Queensland governments have spent \$2.1 billion on the New England Highway. This equates to nine per cent of all National Network road funding outside the capital cities – spent on a road carrying five per cent of the traffic.

Like the Pacific Highway along the coast, the New England Highway links Sydney and Brisbane, by an inland route. In fact, the New England Highway is the only National Land Transport Network highway that forms a second link between two important hubs, whether these are capital cities, major centres of commercial activity or inter-modal transfer facilities.

Over the past decade, more was spent per vehicle kilometre on the New England Highway than on the far more heavily used Pacific Highway (Figure 3.6), and only slightly less per heavy vehicle kilometre. This is despite the fact that the Pacific Highway is the most heavily used highway in Australia, ranking only slightly behind the Hume Highway for heavy vehicle traffic, and that the Pacific provides a shorter and faster link between Sydney and Brisbane than the New England highway.

Figure 4.5: Heavy vehicle traffic volumes on the New England Highway have dropped

Annual average daily traffic, heavy vehicles



Source: BTRE (2006); BITRE (2014e); Additional unpublished BITRE data

Spending on the New England Highway may have been based on an expectation that highway traffic volumes would rise steadily. While this was the case for some highways, it was not true on the New England Highway.⁹⁷ In fact, heavy vehicle traffic volumes on the New England Highway actually decreased as the Pacific Highway improvements resulted in a higher share for that road

⁹⁷ Projections published by the Bureau of Transport and Regional Economics (BTRE) in 2006 (based on 1999 traffic data) projected continued growth in heavy vehicle traffic on the New England Highway. Updated traffic volume data from 2011-12 (published in 2014) show that the growth did not eventuate.

(Figure 4.5), particularly after the opening of the Yelgun to Chinderah bypass in 2002.⁹⁸

Much of the New England Highway runs through the Federal division of New England, and it is the most important highway in that electorate. Between 2001 and 2013, the seat was held by the independent member Tony Windsor, and was a focus of Commonwealth government attention, particularly during the minority government of 2010-13 when Mr Windsor was one of the six crossbenchers holding the balance of power.

⁹⁸ Government of New South Wales (2005)

5 How can we get better value for money?

The overwhelming problem in transport infrastructure is the difficulty of knowing which projects are worthwhile. There is not enough transparency and too little information is available to the public. What there is indicates a portfolio of transport infrastructure that has too many low-benefit projects, and not enough discipline around the spending of public money.

Governments should make decisions in the economic and social interests of the Australian community. The community needs to have confidence that this is occurring.

Recognising that the community wants better assurance, governments have established infrastructure advisory bodies to improve the quality and transparency of infrastructure spending.⁹⁹ The most established of these bodies, Infrastructure Australia and Infrastructure NSW, have now been in operation for over five years.

Despite these initiatives, governments' record of spending on roads and rail provides little reassurance of the quality and rigour of decision-making. There are still many examples around the country of politicians making promises in election campaigns or committing to projects on the basis of a poor-quality business case or no business case at all.

This chapter makes three recommendations designed to impose greater discipline on governments planning to spend public money on transport infrastructure.

⁹⁹ Infrastructure Australia Bill (2008), Infrastructure Australia Amendment Bill (2013)

5.1 Governments should not be able to commit public money to transport infrastructure until a rigorous, independent like-for-like evaluation and the underlying business case have been tabled in the parliament

State spending

State government ministers should only be able to commit public funding to transport infrastructure projects after a rigorous independent evaluation and the underlying business case for the project has been tabled in the parliament.

The evaluation of the business case should be conducted by an agency that is independent, with clarity of mission, and is sufficiently resourced and skilled.

Independence should be achieved through:

- an obligation to report to the parliament, not the minister;
- an obligation that the head of agency, not a board, is responsible for reporting, and that the head of agency is appointed by governor in council for a fixed term with limited grounds for termination.

Clarity of mission should be achieved by:

- an obligation to provide information on the merits of proposals and their alignment with needs;
- a requirement to report on projects where the benefits do not outweigh the costs as well as the ones where they do.

Sufficient resourcing and the requisite technical skills should be achieved through:

- the scope to return to parliament if the environment changes in a way that could materially change the case for or against a project;
- the authority to demand that any person or agency, government or private, provide information to enable it to conduct its analysis;
- the freedom to consult private sector operators, academics and other experts as required.

The evaluation agency should be separate from the government agency promoting the project. Reporting to the parliament creates an independent source of information to the public, as occurs with the auditor general, the ombudsman and, at the Commonwealth level, the Parliamentary Budget Office.

Once the evaluation and underlying business case have been tabled in the parliament, ministers should be free to approve projects and commit public funding. In cases where they commit to projects with lower net benefits, the independent evaluation will enable an informed community debate about what people most value.

Commonwealth spending

Commonwealth ministers should establish equivalent arrangements for projects where Commonwealth money may be spent. Where a potential project would have both Commonwealth and state funding, the Commonwealth would rely on the publicly available state evaluation and business case. As at the state level, there should be a clear separation between an agency that

is promoting a project and the evaluation agency. Where the Commonwealth body needs to evaluate a proposal for itself, it should have the authority to demand other people and agencies provide information to enable it to conduct its analysis.

The Commonwealth body should have enough resources to enable it to refine the cost-benefit analysis methodology to better assess bundles or networks of projects and to consider the impact of wider economic impacts, both for the Commonwealth and also on behalf of the states.

Once fully implemented, this recommendation should increase the proportion of public money spent on projects with net benefits to the community.

Commonwealth and state infrastructure advisory bodies as presently constituted have some but not all of these characteristics. A more rigorous and binding assessment process could be achieved if these bodies could be given greater licence, as outlined above. Alternatively, their functions could be assigned to existing agencies whose role is the provision of independent rigorous assessments, such as the Parliamentary Budget Office or the Productivity Commission.

5.2 Subject to recommendation 5.1 being fully established, governments should build all projects where the benefits outweigh the costs

Once the public can be confident that funding can only be committed after a rigorous independent like-for-like comparison has been tabled in the parliament, there is a strong case that all projects with net benefits should be built.¹⁰⁰

Recommendation 5.1 will, if implemented, improve the quality of government spending on transport infrastructure. A higher proportion will be spent on infrastructure where the benefits outweigh the costs. Where the benefits do not outweigh the costs, governments will need to present the case for proceeding, whether it is because they are seeking to achieve a minimum standard of access for a rural community, want to facilitate a major international event, or some other reason.

Commonwealth and state ministers for transport infrastructure should therefore commit to building all projects with net benefits. It is government's role to provide the transport infrastructure services that citizens would choose to purchase themselves at prices that reflect all costs and externalities.

Committing to building all projects with net benefits would be a substantial step away from the current system where governments implicitly or explicitly set a budget for transport infrastructure, and then allocate funds within that. The current strategy is good for limiting wasteful spending, but is less effective at ensuring that infrastructure that should be built is built.

¹⁰⁰ A rule that benefits should outweigh costs may include a buffer to recognise optimism bias and the uncertainty inherent in complex assessments, and/or sensitivity studies, scenarios and robustness tests.

In the short term, a commitment to build all transport infrastructure projects with net benefits would be challenging for budget managers, given concerns about the quality of project proposals,¹⁰¹ and given that such an approach would reduce the cash measure of the budget surplus. But the Commonwealth already funds several very large 'demand driven' programs, for which expenditure is managed using eligibility 'hurdles' analogous to the proposed 'benefit greater than cost' hurdle proposed for infrastructure funding. For example, the 2014-15 budget included an estimate of \$146 billion of spending on welfare payments, paid to people who meet strict legislated eligibility criteria.

There is a difference between what's good for the budget and what's good for the public. Running a government is not the same thing as running a corporation: if a project offers net benefit to the community, there is an argument that the community should have it.

Governments have several funding options available to them:

- Raising those taxes that are least distorting to the economy, primarily Commonwealth taxes on income and consumption
- Reductions to lower value spending (especially to low value transport infrastructure)
- User charges and betterment levies (with a clear contender being road user charging).

¹⁰¹ Concerns about the quality of project proposals are rarely expressed publicly. An exception has been the former head of Infrastructure Australia, who has made widely-publicised criticisms of project proposals. See, for example, OpenAustralia.org (2014); Saulwick (2014)

5.3 Subject to recommendation 5.1 being fully established, Commonwealth funding to the states should stick where it hits

Commonwealth funding decisions should no longer be overridden by the sharing out of the GST. The Commonwealth Treasurer should instruct the Commonwealth Grants Commission to prepare its next assessment of GST relativities on the basis that transport infrastructure funding has no impact.

Once the public has reason to be confident that funding is only provided for transport infrastructure where the benefits outweigh the costs, then such funding decisions should no longer be partially or fully cancelled out through the GST distribution process.

Provided Commonwealth funds for transport infrastructure are only committed after rigorous independent evaluation and the underlying business case have been provided to the parliament, the funding decisions should be fully quarantined from assessment for GST relativities (Section 4.2).

This would foster investment in the productivity of key economic centres. The impact would be to support the prosperity and the revenue base of the nation as a whole.

A state should not receive a smaller share of the GST pool because it builds transport infrastructure, with Commonwealth support, that adds value to the national economy.

In summary, spending public money is a responsible task, and governments should take it seriously. They should spend public money carefully, after due diligence, and in the full glare of public transparency.

Appendix A: Cost-benefit analysis in transport infrastructure project appraisal

Cost-benefit analysis becomes relevant where one or more potentially viable options are being considered to address a particular need identified through the planning processes for a town or suburb, a city, a state or the country as a whole. This planning is carried out to assess current and future needs of the community to support the economy and people's desires to get about and to live in an attractive location.

Policymakers identify the objectives for transport policy, explore potential reform and investment options to meet those objectives, and identify those initiatives most likely to deliver on those objectives at least cost. This is the point where cost-benefit analysis comes into play to assess different proposals.

Selecting the right projects and in the optimal combination is the most important aspect of achieving good outcomes for the community from public infrastructure. As such, effective appraisal of potential transport infrastructure initiatives – including like-for-like comparisons of their potential net benefits – is crucial to making the right choices. Deciding whether it is more valuable to go ahead now or later is also important to achieving good outcomes.

A.1 What is cost-benefit analysis?

Cost-benefit analysis is a widely used method to assess whether a proposed public infrastructure project will deliver benefits to the community that exceed its costs, and to make like-for-like

comparisons to prioritise projects.¹⁰² Cost-benefit analysis seeks to count, in monetary terms, the benefits and costs of a new initiative to all members of society. Since costs and benefits occur in different years over the life of the project – for example much of cost of new infrastructure occurs up front during construction, but users benefit over the life of the asset – all benefits and costs are converted into common dollars using a discount rate.¹⁰³ Unlike financial appraisals that focus solely on net revenues, cost-benefit analyses account for social and environmental costs and benefits, and do so most effectively when these can be estimated in monetary terms.

The summary indicators of cost-benefit analysis presented to decision-makers are:

- **Net Present Value (NPV):** gives an indication of the magnitude of the net benefit of the initiative to society. Projects are appraised positively if the net present value of the project impacts is greater than zero.
- **Benefit-Cost Ratio (BCR):** is a measure of the value for money of a project. A BCR greater than one indicates that a project will provide net benefits to the community.

¹⁰² For example, see Infrastructure Australia (2016a); Treasury NSW (2007); DTF Victoria (2013); Queensland Treasury (2015); Australian Transport Council (2006); Department of Finance and Administration (2006); HM Treasury (2011).

¹⁰³ The discount rate reflects consumers' preference to receive a dollar today rather than the same dollar in the future.

A key advantage of cost-benefit analysis is that projects can be compared on a like-for-like basis, as can different design and implementation options for a given project.¹⁰⁴

Most of the costs and benefits of transport infrastructure initiatives are well known. The main costs are construction, maintenance and operating costs. These can be derived from similar projects constructed in the past, or from tenders. The most important benefits of new transport infrastructure are travel-time savings, both for travellers and freight transport, as well as new trips taken. Models are generally used to estimate the demand of passengers or volume of goods transport that will benefit from a new project, which are then converted into monetary terms by estimating the value of time saved for users.¹⁰⁵

A.2 Limitations of cost-benefit analysis to evaluate transport infrastructure proposals

When properly conducted, cost-benefit analysis is a valuable tool for guiding project selection and improving the transparency and quality of decision-making.¹⁰⁶ However, cost-benefit analysis is not without its limitations, nor its critics.

The **methodological limitations** of cost-benefit analysis are well documented.¹⁰⁷ First, there is often significant uncertainty about benefits that a new project will deliver, and the costs it will impose. After all, cost-benefit analysis evaluates the expected impact of a new initiative.

Estimates of the main benefits from transport infrastructure projects of time savings, lower vehicle operating costs, and fewer accidents depend heavily on models projecting future usage rates over the life of the project, which will always be subject to significant uncertainty.¹⁰⁸ Accounting for behavioural responses and network effects in modelling usage and traffic flows is especially important, yet very difficult. For example, demand forecasts for major urban road and public transport projects should account for user behaviour changes caused by the project, including induced demand.¹⁰⁹ Estimates of the lifetime costs of a project can also be challenging, especially when it involves new technologies, because infrastructure lasts a long time. For example, Infrastructure Australia requires project proponents to include benefits at the 50th percentile, and costs at the 90th percentile, when calculating the benefit-cost ratio.¹¹⁰

Second, key assumptions used in cost-benefit analysis can have a large bearing on the results. For one, the results depend upon the assumptions made about the base case where the initiative does not proceed. This base case should reflect the next best solution available, or some minimum level of new investment to maintain the existing infrastructure, rather than a 'do nothing'

¹⁰⁴ Productivity Commission (2014), p.93.

¹⁰⁵ Van Wee and Tavasszy (2008), p.41

¹⁰⁶ Productivity Commission (2014), p.75

¹⁰⁷ For a discussion of the methodological challenges of cost-benefit analysis, see Van Wee and Tavasszy (2008).

¹⁰⁸ For example, the conventional cost-benefit ratio reported in the Melbourne Metro business case varies between 1.1 and 1.4, depending on the choice of transport model used for the analysis (Victorian State Government (2016), p.43).

¹⁰⁹ For example, the Victorian Auditor General found that road authorities failed to adequately assess the traffic induced by investments in new road capacity. In one case, daily traffic in 2010 exceeded the 2011 forecast by over 50 per cent and was close to the volumes expected in 2031 (Victorian Auditor General (2015b), p.9).

¹¹⁰ P50 and P90 are respectively the project costs, with sufficient contingency to provide a 50 and 90 per cent likelihood that these costs will not be exceeded (Infrastructure Australia (2016c)).

scenario that could lead to an inflated estimate of the net benefits for the initiative being appraised.¹¹¹

Similarly, the choice of discount rate can make a huge difference to the expected payoff from transport projects with costs and benefits spanning decades. Government bodies provide guidance on standardised parameter values, including discount rates, to facilitate comparisons of projects.¹¹² However, the appropriate level of the discount rate remains the subject of significant debate.¹¹³

Further, the current convention of excluding the efficiency losses associated with raising taxation to pay for an infrastructure project may make a substantial difference. When all projects are fully or substantially funded from taxation, there are efficiency costs to raising taxes that are over and above the actual amount of funds used. While these efficiency costs are less material when a set

¹¹¹ Infrastructure Australia (2016b) requires proponents of initiatives to conduct a 'real world' assessment of the future infrastructure and operations, making reasonable assumptions of future changes, and should not assume that the infrastructure and operations of today continue 'as is' (p.28).

¹¹² For example, *ibid.* requires project appraisals to adopt a 7 per cent real discount rate in cost-benefit analyses, alongside sensitivity analysis of the results using discount rates of 4 per cent and 10 per cent (p.37). Most state governments also require a 7 per cent discount rate in project appraisals, as does the Commonwealth Government (Office of Best Practice Regulation (2016)). Similarly, the Austroads guide for road project evaluation contains recommended parameter values for fuel costs, values of time travel savings, unit crash costs and environmental externalities (BITRE (2014c), p.8).

¹¹³ In a research paper for the Productivity Commission, Harrison (2010) recommends adopting an 8 per cent discount rate with sensitivity testing conducted over a range of 3 per cent to 10 per cent. The 8 per cent discount rate reflects social opportunity cost of capital, measured by the long-term before-tax real rate of return earned by private capital in Australia. In contrast, HM Treasury (2011), uses a 3.5 per cent discount rate, which is an estimate of the 'social time preference rate' (p.26).

budget is being allocated among various spending programs, it matters more when governments contemplate substantially changing their spending levels (as proposed in Section 5.2).

Third, the methodologies employed to estimate wider economic impacts (WEIs), such as agglomeration economies, improved competition in imperfectly competitive markets and changes to labour markets remain very imprecise.¹¹⁴ They do not capture all relevant impacts, such as changes in amenity value. Since WEIs are difficult to estimate separately from the direct impacts of new initiatives, adding WEIs to the costs and benefits included in conventional cost-benefit analysis risks double-counting these impacts.¹¹⁵ Work is underway to build Australian datasets to facilitate better estimation of WEIs.

Fourth, potential projects may result in significant social and environmental impacts, yet these can be difficult to estimate, and particularly difficult to express in monetary terms.¹¹⁶ A good cost-benefit analysis will identify and describe non-monetised benefits and costs, where possible quantifying them as physical units.¹¹⁷

In addition, **institutional factors** can influence the results of cost-benefit analysis. Unrealistic cost and demand forecasts arise from 'strategic misrepresentation,' where project proponents responsible for cost-benefit analysis have incentives to see the

¹¹⁴ Infrastructure Australia (2016b) requires that wider economic impacts be excluded from headline cost-benefit ratios (pp. 39-41).

¹¹⁵ Dobes and Leung (2015) conclude that, 'in the case of WEIs, enough caveats have become apparent to signal that a thorough review of the approach is desirable before its acceptance and automatic application to transport projects (p.91).

¹¹⁶ Social and environmental impacts may include social cohesion, urban amenity and biodiversity.

¹¹⁷ BITRE (2014c), p.4

project proceed.¹¹⁸ Recent evidence suggests that so-called 'optimism bias' is significant. One recent study of more than 2,000 infrastructure projects concluded that cost-benefit analyses for large projects tend to overestimate cost-benefit ratios by between 50 and 200 per cent.¹¹⁹ Other recent studies have found evidence of systemic underestimation of the costs of major infrastructure projects, leading to repeated cost overruns,¹²⁰ and overestimation of benefits, particularly for patronage forecasts.¹²¹

Despite its flaws, cost-benefit analysis remains the most rigorous and comprehensive tool available. While cost-benefit analysis can be manipulated, there is a broad consensus that cost-benefit analysis is much more value-free than the best available alternatives, such as multi-criteria analysis.¹²² At its best, it is a disciplined approach to considering the full range of potential project impacts and attempts to quantify them in a consistent and rigorous manner. It enables projects and options to be compared within and between transport modes, and across jurisdictions.

¹¹⁸ Productivity Commission (2014), p.1

¹¹⁹ For example, see Flyvbjerg and Sunstein (2015); Flyvbjerg, *et al.* (2003); Flyvbjerg, *et al.* (2002).

¹²⁰ Flyvbjerg, *et al.* (2002);

¹²¹ Flyvbjerg, *et al.* (2005)

¹²² In multi-criteria analysis, an initiative is evaluated on multiple criteria, such as economic, environmental and social outcomes, rather than converting all benefits and costs into monetary terms as is required by cost-benefit analysis. However, to support like-for-like comparisons across potential initiatives, the impacts identified in multi-criteria analysis must still be summarised using weights for each impact to form a single summary measure. Since these weights are subjective, it is therefore much easier to manipulate the final outcomes of multi-criteria analysis compared to cost-benefit analysis. BITRE (2014c), p.5

A.3 Improving the use of cost-benefit analyses

If adopted, the recommendations in this report would lessen the risk of optimism bias by separating project proponents from those appraising potential projects (Section 5.1).¹²³ Transparency would also help lessen the risk of optimism bias; publishing business cases would enable public scrutiny of key assumptions and forecasts. Reference class forecasting – the comparison of forecasted costs and benefits to those of similar recent projects – is another useful method of reducing the likelihood of optimism bias.¹²⁴

Of course, the biggest drawback of cost-benefit analysis is that it is often not done at all, or done after the decision to proceed has already been made (Section 1.4). While cost-benefit analyses are no magic bullet, basing spending decisions on the results of properly conducted cost-benefit analyses – however flawed – would still be a big step forward from the decision-making processes behind many transport infrastructure-spending decisions currently.

Governments may have legitimate reasons to make project selection decisions that run contrary to the rankings suggested by cost-benefit analysis. For example, some aspects of a project that are not quantifiable in monetary terms may be considered important. There may also be network effects that are to quantify. Decisions that run counter to cost-benefit analysis should be explained to the community.

¹²³ Flyvbjerg (2008) recommends such separation, and also that forecasts should be subject to independent peer review, and forecasters should be professional penalties where they 'consistently and foreseeably produce deceptive forecasts' (p.138).

¹²⁴ Van Wee and Tavasszy *ibid.*, p.48.

A.4 The complementary role of real options analysis

Sometimes it makes sense to delay a project, even if it would deliver net benefits to the community. This happens when the net benefits would be greater if it went ahead later.¹²⁵ For example, a road project with a given capital cost may deliver greater benefits in the future, in terms of avoided congestion, than it will if built now. The real decision is when is the optimal time to build the project.¹²⁶

Real options analysis is a method for decision-makers to find the best time to proceed with an infrastructure project, and is used in combination with cost-benefit analysis to assess proposals in a way that maximises the expected benefits of transport infrastructure investment, especially in reducing the risks of poor outcomes.

A 'real option' is a decision taken today that makes it possible for policymakers to take a particular action in the future.¹²⁷ Real options are similar to financial options but are exercised over real assets rather than financial assets.¹²⁸ For example, building a road project with a smaller capacity initially, but with the scope to expand capacity later by adding extra lanes, can allow for flexible

responses as new information emerges, such as demand from road users. The objective of a real options approach is to choose the set of options that maximise the expected net present value in the future under a range of scenarios.

¹²⁵ For example, in reviewing initiative business cases, Infrastructure Australia (2016b) (p.38) uses the first year rate of return (FYRR) as a measure of whether a project's intended date of operation is too early, too late or appropriate. The FYRR is calculated as the net benefits (benefits minus operating costs) of the initiative in the first full year of operation of an initiative, divided by the present value of the investment costs expressed as a percentage. A FYRR below the discount rate suggests a project could be delayed in order deliver optimal value to the community, while a FYRR greater than the discount rate suggests it would be worth delivering the project earlier, if possible.

¹²⁶ BITRE (2014c), p.13

¹²⁷ Ibid., p.13

¹²⁸ DTF Victoria (2014)

Appendix B: The National Land Transport Network

The National Land Transport Network began its existence as the National Highway, defined by the Whitlam Government in the National Roads Act 1974¹²⁹. The purpose of the act was to formalise an agreement for the federal government to grant financial assistance to the states for the construction and maintenance of national highways and major commercial roads.

In its current form, the network defines a series of connected road and rail links that are considered to be of national importance because they connect important hubs, whether capital cities, major centres of commercial activity or inter-modal transfer facilities¹³⁰.

National Network links are in a much better position to access Commonwealth money for improvements and upgrades. For appropriate investment projects, the *National Land Transport Act 2014 (Cwth)* allows the minister to approve an explicit allocation of Commonwealth money to fund a proportion of costs¹³¹.

In addition, the most recent determination of GST distribution included special treatment of Commonwealth funding of National Network projects (see section 4.2):

Several additions have been made to the network since the inception of the National Highway in 1974. The National Highway only included links between capital cities, as well as the roads from Brisbane to Cairns and Hobart to Burnie. The AusLink

(National Land Transport) Act 2005¹³² added the national rail network, and also expanded the road network significantly to include, among others:

- The Pacific Highway, as a second route between Sydney and Brisbane (the National Highway included only the New England Highway).
- Roads linking several smaller cities to their nearest state capital; Geelong, Wollongong, Dubbo, Bunbury, Sale.
- The East Tamar Highway between Launceston and Bell Bay.

Variations to the Act in 2007¹³³, 2008¹³⁴, 2009¹³⁵ and 2015¹³⁶ added several small sections of road, some newly built or proposed, including the road from Geelong to Colac in 2009 (see section 4.3).

¹²⁹ National Roads Act (1974)

¹³⁰ National Land Transport Act (2014a), Part 2, Division 5.

¹³¹ Ibid., Part 3, Division 2.

¹³² National Land Transport Act (2005)

¹³³ National Land Transport Act (2007)

¹³⁴ National Land Transport Act (2008)

¹³⁵ National Land Transport Act (2009)

¹³⁶ National Land Transport Act (2014b)

Table B.1: Components of the National Land Transport Network

No	Route Designation	Length (km)	Heavy vehicle kilometres 2011-12	Investment 2005-06 to 2014-15 (\$ million)	Route Description
1	Sydney-Melbourne	807	3,190,522	2,404	Hume Highway, Sydney to Melbourne
2	Sydney – Brisbane (Pacific)	885	3,005,262	7,833	Pacific Highway, Sydney to Brisbane
3	Melbourne - Brisbane	1,532	2,034,189	842	Goulburn Valley Highway, Seymour to Tocumwal; Newell Highway to Goondiwindi, Gore Highway to Toowoomba; Warrego Highway to Brisbane
4	Brisbane – Cairns	1,677	1,970,795	2,848	Bruce Highway, Brisbane to Cairns
5	Melbourne – Adelaide	703	1,268,514	777	Western Highway, Melbourne to VIC/SA border; Dukes Highway to Tailem Bend; Princes Highway to Adelaide
6	Perth – Adelaide	2,666	970,471	259	Great Eastern Highway, Perth to Coolgardie; Coolgardie-Esperance Highway to Norseman; Eyre Highway to Port Augusta; Princes Highway to Adelaide
7	New England	808	907,757	2,051	Hunter Expressway, Newcastle to Branxton; New England Highway to Warwick; Cunningham Highway to Brisbane
8	Perth – Darwin	3,689	686,212	709	Great Northern Highway Perth to near Kununurra; Victoria Highway to Katherine
9	Sydney – Adelaide	949	581,963	145	Sturt Highway, Tarcutta to Adelaide
10	Brisbane – Darwin	2,334	536,902	608	Warrego Highway, Toowoomba to Morven; Landsborough Highway to Cloncurry; Barkly Highway to Three Ways
11	Melbourne – Sale	170	444,101	159	Princes Highway, Melbourne to Sale
12	Hobart – Burnie	351	424,140	150	Brooker Highway, Hobart to Granton; Midland Highway to Launceston; Bass H'way to Burnie
13	Melbourne – Mildura	533	420,919	233	Calder Highway, Melbourne to Mildura
14	Sydney - Dubbo	367	414,060	949	Great Western Highway, Sydney to Dubbo
15	Melbourne – Geelong	48	276,016	254	Princes Freeway, Melbourne to Geelong. Includes stages 1 to 3 of the Geelong Ring Road.
16	Sydney – Wollongong	63	227,944	118	Princes Highway, Sydney to Wollongong
17	Perth - Bunbury	135	191,035	907	Forrest Highway, Perth to Bunbury
18	Canberra	126	178,200	87	Federal Highway, Canberra to Yarra; also Barton Highway, Canberra to Yass
19	Townsville – Mt Isa	761	146,041	184	Flinders Highway, Townsville to Cloncurry
20	Geelong - Colac	89	123,263	438	Princes Highway, Geelong to Colac. Includes stages 4A & 4B of the Geelong Ring Road
21	Launceston – Bell Bay	58	38,987	115	East Tamar Highway, Launceston to Bell Bay
22	Adelaide - Darwin	2,710	417,369		Stuart Highway, Port Augusta to Darwin

Source: Grattan analysis of Commonwealth, State and Territory budget papers 2005-06 to 2014-15; BITRE (2014e); BITRE (unpublished).

Appendix C: Our approach to analysing government spending on transport infrastructure

The report analyses capital spending on transport infrastructure by the Commonwealth and state governments over the decade 2005-06 to 2014-15.

This appendix sets out the approach to collecting and analysing data from Commonwealth, State and Territory government budget papers on transport infrastructure spending. Overall, the analysis of government spending on transport infrastructure contained in this report can be split into two broad approaches:

1. An assessment of **overall trends in spending on transport infrastructure** including spending breakdowns by state, region, transport mode and funding source (Section 1.5; Section 3.1; Section 3.2.1; Section 3.2.2; Section 3.2.4; Section 3.2.5; Section 4.1 and Section 4.2).
2. An assessment of **spending on particular routes listed on the National Land Transport Network** (Section 3.2.3 and Section 4.3).

C.1 Assessing overall trends in spending on transport infrastructure

Transport infrastructure spending is analysed as reported in Commonwealth and state budget papers. Spending includes capital investment by the public sector included in states' capital investment budgets on transport infrastructure. It includes all items relating to transport infrastructure, including: roads; rail; ports; public transport; airports; and bicycle infrastructure. Transport infrastructure spending excludes recurrent (i.e. operating) expenditure, which, in the case of transport infrastructure, relates to maintenance.

For state governments, figures on transport infrastructure spending are drawn from capital investment plans in state budget papers for the coming year, with the exception of Western Australia, where data on actual report investment amounts was collected from state budget papers for the following year.¹³⁷ For example, state transport infrastructure spending for 2013-14 reflects planned capital spending on transport reported in the 2013-14 budgets for each state. For Western Australia, state transport infrastructure spending for 2013-14 reflects the revised estimate of the amount spent, as detailed in the 2014-15 budget. While it would be preferable for our data to reflect actual, rather than budgeted, capital spending on transport, most states do not report actual capital spending on transport in sufficient detail for our analysis. However, it is not expected that the use of budgeted, rather than actual, capital spending on transport will materially affect our conclusions.

For the Commonwealth Government, figures on transport infrastructure spending are drawn from actual spending amounts reported in budget papers for the following year. For example, Commonwealth infrastructure spending for 2013-14 reflects revised spending figures reported in the 2014-15 budget.

¹³⁷ In the case of the ACT, the 2014-15 budget papers contain detail on individual capital works items, whereas previous years' budget papers contained no such breakdown. For our analysis, we estimated the amount of transport infrastructure investment for all prior years by assuming a similar proportion of capital works related to transport as in 2014-15 (37 per cent). Given the relative size of ACT expenditure on transport infrastructure, this approximation is not a serious shortcoming.

The bulk of Commonwealth transport money is paid to state governments. When the Commonwealth provides funding to a state government, which is then spent, the expenditure is reported in both Commonwealth and state budget papers. To avoid double counting of Commonwealth transport funding to states, state spending funded by Commonwealth grants is not included in figures on total transport infrastructure spending across states (Figure 1.3; Figure 3.1; Figure 3.2).

For some items in Commonwealth budgets, the budget is not explicit for each state about the proportion of payments made to local governments, as opposed to state governments – only an overall amount for the state is included. In each of these cases, however, the nationwide amount is provided with an apportionment into local and state government payments. Thus, we have assumed a similar proportion is paid to local government in each state. It is likely that the true distribution deviates from this, but it is unlikely the deviations are material for our analysis. Due to difficulties in obtaining the necessary data, we do not include local government own source spending on transport infrastructure.

Where geographical breakdowns of transport infrastructure spending are presented, such as in Figure 3.4, the location of spending is inferred from Commonwealth and state budget papers. Where there was insufficient information to determine this, such spending were generally excluded from the analysis.¹³⁸ An important exception is the significant expenditure on Queensland roads in 2011-12 only identified as 'National Disaster

¹³⁸ Examples of items treated this way include 'Rolling stock enhancements' for rail, or 'Infrastructure maintenance improvement works' for roads.

Recovery' in state budget papers, where its exclusion would materially affect our results.¹³⁹

When identifying spending on transport infrastructure that is largely, or exclusively, dedicated to the resources industry in Figure 3.8 and Figure 3.9, we follow the approach of Peel *et al.* (2014).¹⁴⁰ Consistent with their methodology, we include all the items they have identified as "wholly", "primarily" or "partly" for the resource sector for the decade of spending data collected.

C.2 Assessing roads capital spending on the National Land Transport Network

Section 3.2.3 and Section 4.3 analyse capital spending on roads listed on the National Land Transport Network.

In most cases, spending on transport infrastructure can be attributed to individual projects, or routes. Where spending could not be identified for roads listed on the National Land Transport Network, those roads are excluded from our analysis. For example, the Northern Territory did not provide a break down of investment into individual projects for all years. As such, parts of the National Land Transport Network such as the Stuart Highway, between Adelaide and Darwin, are not included in our analysis of highway investment on the national land transport network (Section 3.2.3). Investment amounts for the Great Northern / Victoria Highway, between Perth and Darwin, and the Warrego / Landsborough / Barkly Highway, between Brisbane and Darwin, are included in the analysis, although spending on these roads

¹³⁹ In this case, spending was apportioned between Brisbane (2 per cent) and regional areas (98 per cent) using the same breakdown as was reported for similar spending on 'National Disaster Recovery' in 2012-13 and 2013-14, where more detailed project-level breakdowns were available.

¹⁴⁰ The resources sector includes coal, gas, minerals, mining, petroleum.

may be understated. However, since spending on these roads is not the focus of these sections of the report, any data gaps are unlikely to materially affect our conclusions.

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