GRATTAN Institute

March 2017

What price value capture?

Marion Terrill

Grattan Institute Support

Founding members

Australian Government

Affiliate Partners

Google

Medibank Private

Susan McKinnon Foundation

Senior Affiliates

EY

Maddocks

PwC

McKinsey & Company

The Scanlon Foundation

Wesfarmers

Affiliates

Ashurst

Corrs

Deloitte

GE ANZ

The Myer Foundation

Urbis

Westpac

Grattan Institute Report No. 2017-05, March 2017

This report was written by Marion Terrill, Grattan Institute Transport Program Director, and Owain Emslie, Associate. Hugh Batrouney, Lucille Danks and Paul Austin made substantial contributions to the report.

We would like to thank numerous industry participants and officials for their helpful comments and input.

The opinions in the report are those of the authors and do not necessarily represent the views of Grattan Institute's founding members, affiliates, individual board members reference group members or reviewers. Any remaining errors or omissions are the responsibility of the authors.

Grattan Institute is an independent think-tank focused on Australian public policy. Our work is independent, practical and rigorous. We aim to improve policy outcomes by engaging with both decision-makers and the community.

For further information on the Institute's programs, or to join our mailing list, please go to: http://www.grattan.edu.au/

This report may be cited as: Terrill, M. and Emslie, O. (2017). *What price value capture?*. Grattan Institute.

ISBN: 978-0-9876121-2-0

Overview

Construction of Hong Kong's metro railway was funded solely from the sale of development rights around stations. Close to one third of London's CrossRail is being funded by levies on nearby businesses. 'Value capture' is back in fashion, and the calls are growing louder for Australia to tap into these seemingly wonderful revenue streams.

The Australian Government is decreeing that the states should routinely consider value capture opportunities in all future public infrastructure projects. But what exactly does this mean? And is value capture better or worse than the current way we fund infrastructure?

At its core, value capture is a tax on the increase in land values that results when a new or upgraded piece of infrastructure improves an area's accessibility. Despite the hype and optimistic notions of 'free money', in reality infrastructure must be paid for either by users or by taxpayers of one kind or another.

The theory is very attractive. Value capture is marvellously fair, because it only applies to those who benefit from the particular new project. So the people of western Sydney do not help fund a new railway station on the North Shore – or vice versa. And because value capture only taxes windfall gains, it generally shouldn't discourage people from buying and selling, developing land or investing in their businesses.

But putting all this into practice is hard. Property prices go up – and down – for many reasons. Drawing a boundary around a new piece of infrastructure to distinguish those who must pay the new tax from those too far away to benefit is bound to involve rough justice. It's not easy for governments to convince people that the new tax bill they receive still leaves them better off – homeowners receive the benefit of the new project on paper but have to pay the tax bill in cash. And value capture is very hard to apply to projects such as roads and hospitals where the benefits are more diffuse. The apparent fairness of value capture evaporates if the beneficiaries of rail projects pay extra while the beneficiaries of other government projects do not. These challenges may explain why value capture has been used so rarely in Australia.

While many financiers are keen on "Tax Increment Financing", the arguments in favour of it are specious. Ultimately such innovative financing mechanisms cost more than governments borrowing for themselves, don't necessarily improve risk management, and still involve taxing landowners.

As a result, state governments should generally avoid value capture taxes because better, fairer and simpler taxes are available to them. They would serve their constituents better by imposing broad-base low-rate taxes, such as land taxes, instead of reaching for narrow-base high-rate value capture taxes.

But if, despite this, a state government does introduce a value capture tax, it should not cherry-pick projects but instead legislate standard criteria to apply consistently. A single flat rate of tax should be imposed on the increase in unimproved land value of affected properties.

Whatever the taxation arrangements, governments can create additional value from infrastructure projects by joint development around them. They can sell government land that is no longer needed after construction, or sell new development rights from rezoning land in the neighbourhood. But the value of such schemes will depend on how much the government already owns, and the demand for new intensive development.

Attractive enough in theory, there is nothing easy about capturing value.

Table of contents

List of Figures

1 What is value capture?

"Value capture" is the name given to a policy by which governments capture some of the increased value of land that results from the building of a piece of new infrastructure. Typically, the money the government "captures" is used to help fund the project.

It's a concept that has been around for a long time: so-called betterment levies contributed to building the Sydney Harbour Bridge in the 1920s and Melbourne's rail City Loop in the 1980s. And it's still an enticing concept: construction of Hong Kong's metro is funded solely from the sale of development rights around stations; nearly one third of London's CrossRail is being funded by levies on nearby businesses.

Is it any wonder that governments want more of this? The Commonwealth argues that,

> Done right, value capture can accelerate infrastructure investment alongside urban renewal, and deliver benefits for households, governments, businesses and developers.
>
> *Smart Cities plan*, 2016

The Prime Minister says,

> . . . we want to make sure that the work is done to identify how this project will create value . . . and how some of that can be captured, can be brought to account to defray the cost or support the cost of constructing the rail line. In other words, how can we leverage the taxpayer's dollar to get a better urban outcome from the investment?
>
> Malcolm Turnbull (2016)

The Commonwealth is generally not itself able to introduce value capture, but is promoting it as a way for the states to fund major projects.

> . . . we need to ensure that we are more than just 'an ATM' for the states . . . We are interested in leveraging (the Commonwealth's) spend to attract funding from other sources – such as other levels of government, the private sector, and project beneficiaries – and we see value capture as one very important tool to do this.
>
> Urban Infrastructure Minister Paul Fletcher (2017)

And the states are far from idle. New South Wales expressed support for value capture in its 2012 State Infrastructure Strategy; Infrastructure Victoria released a discussion paper on value capture in October 2016; Queensland recommended its adoption in its March 2016 State Infrastructure Plan.

But the concept as it is being promoted in Australia is muddled. Can it be true that value capture is "not an additional tax"[1] and yet it raises money to fund additional infrastructure? Is it reasonable to place a surcharge on payroll or sales tax to capture increases in land value?[2] Can earmarking existing taxes through Tax Increment Financing somehow raise more funds than without such schemes?[3]

Drawing on experience from around the world and from tax policy principles, this report finds that there are fairer and simpler ways to raise revenue for public infrastructure. But if a government does decide to impose a value capture tax, we propose the most efficient, fair and simple way to do so.

We define value capture as a funding mechanism that:

- Exists for the purpose of partially funding a specific new piece of infrastructure;

1. DIRD (2016a, p. 2).
2. Ibid. (p. 17).
3. *e.g.* PwC (2008).

- Captures some of the windfall gain from a new project that would otherwise remain with landowners; and
- Targets the landowners who receive the windfall gain.

In this chapter, we identify where extra land value comes from, how part of it can be captured to fund the infrastructure, and how this has been done around the world and in Australia – typically raising no more than 20-30 per cent of project value. While value capture can help fund a piece of infrastructure, Tax Increment Financing is a financing and hypothecation mechanism that Australian governments should avoid.

We focus on transport infrastructure, as this is the main form of public infrastructure that changes land values.

1.1 The creation of extra land value

The value of a plot of land increases when it becomes more desirable, whether because of increased amenity, improved accessibility, or a change in the rules about how it can be used.

These are very difficult for individual landowners to influence, at least in the short or medium term. While landowners can improve the buildings and developments on their land, they generally cannot improve the value of the land itself. Extra land value comes largely from the actions of governments and the actions of other landowners.

In this section we explain the three ways governments can increase demand for land and hence its value.

1.1.1 Government can increase the amenity of land

Amenity means livability. Factors affecting amenity include safety and crime, noise and pollution, community facilities such as libraries, schools, parks and swimming pools, and private businesses such as cinemas and restaurants.

Governments influence amenity through direct provision of community infrastructure and through policies that affect the level of crime and safety, how the cityscape is managed, and which businesses locate in the area.

Changes in amenity can have a big influence on land values. But new transport infrastructure is ultimately about accessibility and property rights.

1.1.2 Government can increase the accessibility of land with new transport infrastructure

Accessibility describes the ease of getting to and from an area and moving about within it. Transport infrastructure is a key to accessibility. Can locals and visitors travel quickly and reliably to and from jobs, shops, schools and parks?

Government decisions to invest in new transport infrastructure can improve accessibility and therefore value. For instance, if a government extends a railway line or freeway to a new residential area, it may become viable for people who work further away to live there. Better connected land is more valuable to businesses that need to attract workers and customers.

A current proposal for high speed passenger rail in eastern Australia would rely heavily for its funding on extremely big increases in land values in rural areas that are currently a long trip away from major capital cities (see Box 1 on the following page).

1.1.3 Government can change property rights over land located near new transport infrastructure

The value of a plot of land varies according to the ways the owner can use it. If a plot is zoned for agriculture, the owner cannot build a block

Box 1: Sydney to Melbourne high speed rail

High speed rail proposals for eastern Australia have emerged every decade or so since the 1980s. While some have been presented as involving no cost to government, all have required a subsidy in some form.

The 1980s proposal was for a line between Sydney, Canberra and Melbourne. It had several corporate backers, including BHP and Elders IXL, but was abandoned in 1991 when it became evident the project had failed to secure tax concessions from the Australian Government.[a]

The 1990s proposal by the Speedrail consortium was for a service between Canberra and Sydney. It eventually won a 1998 tender process to proceed with such a plan, on the basis that there would be "no net cost to the taxpayer".[b]

But after a feasibility study was submitted to the Australian Government, there was media speculation that Speedrail would need $1 billion of government assistance, and in 2000, the government terminated the proposal due to fears it would require excessive subsidies.[c]

The current proposal, by a consortium named Consolidated Land and Rail Australia (CLARA), is for a link between Melbourne and Sydney.

The plan involves the creation of eight inland cities of between 250,000 and 400,000 people each; that is, similar in size to Canberra.[d]

CLARA states that this will require no government subsidy because it can be funded completely by land value uplift in the new cities.[e] The new stations would be at locations which are currently uninhabited, rather than in existing towns, as has generally been the case in other proposals for this route.[f]

The plan relies on selling blocks of land in all eight new cities for about $150,000.[g]

This scheme appears to require governments to compulsorily acquire the land at pre-rail prices, and to sell it to the consortium to enable it to fund the project. Once rail plans are known, it is unlikely CLARA will be able to purchase land cheaply without compulsory acquisition powers: landowners will demand a price much closer to the post-rail price.

The economics of the project also require that at least 2 million people move to the new cities over the next 20 years – some 100,000 per year.[h] This is about 30 per cent of Australia's current population growth.[i] It is unclear who would carry the risk of the population growing materially less than this amount.

a. Williams (1998).
b. Laird et al. (2001, pp. 32–33).
c. Ibid. (pp. 32–33).
d. CLARA (2016a); and Manning (2016).
e. CLARA (2016b).
f. Manning (2016).
g. Ibid.
h. A city near Henty would be the last developed, around 2035, see Manning (2016).
i. ABS (2016a, Table 1).

of residential units on it. If a plot is next to a school, the owner probably will not be allowed to build a knackery.

When the rights over a piece of land change, its value usually changes. A typical case is the rezoning of urban land to permit higher density development: if a landowner is permitted to build to 20 rather than 10 stories, the value of the land will rise.

Governments can use property rights to create "new land" in the form of a new platform on which to build a tower, often above railway station redevelopments. An example of this is a tower planned to be built above Ormond Station on Melbourne's suburban rail network.[4] Governments can use their powers of compulsory acquisition to take land from its current owners to develop or sell to developers.

It is available to government at any time to rezone, relax restrictions and otherwise set terms that can be a complement to building. Often known as "joint development", these actions include auctioning air rights,[5] auctioning any government land that is no longer needed after construction, and commercialisation of property and space within government-owned buildings. These decisions can increase the capturable value of a piece of infrastructure.

It makes sense for a government to align its property rights strategy with its infrastructure strategy: rezoning for higher value usage is likely to improve the viability of an infrastructure project and vice versa.[6] For example, a new rail line won't achieve maximum value unless zoning rules allow significant residential density around the stations. And there is little point in rezoning a piece of land if it is too far away from any other amenities for anyone to be motivated to act on the new zoning right.

4. Victorian DELWP (2016); and Carey (2016).
5. Air rights are the property rights above a piece of land; in some situations, such as the protection of a heritage building, the development rights above one piece of land may be transferred to a neighbouring block of land.
6. Schmahmann et al. (2016); and Transport and Infrastructure Council (2016).

1.2 Governments can recoup some of the value from new infrastructure

Governments, and indeed private operators of infrastructure, can act to transfer to themselves some of the new value created by improved amenity, accessibility or greater property rights. The rest of this section assumes that the policy objective is simply to recover some of the cost of the infrastructure that gives rise to the increase in land value, but not to contribute beyond that to general revenue.

In the case of transport infrastructure, value accrues most directly to users. An obvious example is that a new road or train line can offer time savings to travellers. Governments should first seek to tap into this value by imposing user charges.

Additional value above the level of user charges will increase demand for nearby land, and so give rise to higher land values. Governments can capture some of this extra value by taxing landowners.

But it is important to recognise that user charges and taxes on nearby landowners are unlikely to capture all the value from new infrastructure. Some of the value of a new piece of infrastructure goes to the community as a whole.

The following three sections explain how governments can recoup some value from each of these three groups of beneficiaries: users, nearby landowners, and the general community.

1.2.1 Governments can charge users

User charges should encourage levels of usage that make sense for the community as a whole. For example, public transport fares and road tolls should neither be so high that they discourage people from

using infrastructure to its capacity, nor be so low that roads and rail lines become overcrowded and unworkable for those who most need or want to use them.

There is a case for almost all infrastructure being paid for by users, at least in part, rather than through general tax revenue. User charges have two particularly attractive characteristics: people can choose whether they value the service enough to pay for it, and people receive a specific service in return for paying a public transport fare or a road toll. Box 2 on the next page outlines how developer charges are a form of user charge.

But user charges are only workable if people can be prevented at reasonable cost from using the new infrastructure if they don't pay. In practice, it is much more viable to apply a user charge on a new railway line than a new road. Of course, it is certainly possible to apply a toll to a new road, but with only 16 roads in Australia tolled,[7] the overwhelming majority are accessible without a user charge, and where tolls are charged, they are set to recoup costs and generate a profit for the operator, rather than to encourage efficient use of the road.

User charges should vary according to the time of day, because an extra user in peak hour has much more impact on other users than an extra user at a quiet time of day. They should also vary according to location, since an extra person on a crowded train or road has more impact on other users than an extra person on an empty train or road. And those who take up more space (a truck on a congested road; a passenger with a large suitcase on a crowded train) should also pay more.[8]

It is important to note that the discussion above has no regard to the cost of building the road. For the purpose of setting user charges that induce optimal usage of a road, capital cost is irrelevant. User charges may not therefore be sufficient to pay for the road.

1.2.2 Governments can tax nearby landowners

User charges can capture some of the value created by a new piece of infrastructure. But much infrastructure either has no user charge, or its user charge raises less revenue than the cost of the infrastructure.

Beneficiary taxes, betterment levies and other taxes on landowners can capture some of the extra value that is created by a new piece of infrastructure above and beyond what is captured by a user charge. They tax that part of the increase in the value of land near the new infrastructure which exceeds the increase in value of similar land that is further away. The underlying idea is that these specific increases in land prices beyond what would have happened without the new infrastructure can be interpreted as people's valuation of the infrastructure over and above the user charges.

The decision to impose a tax on land that is made more accessible by a new piece of infrastructure raises the question of whether it is the new infrastructure or some other factor that has caused land values to change. Of course, there are many factors that can change land prices, and attributing all of an observed increase in value solely to a new station or bridge may overstate the effect of that new infrastructure.

But precise attribution is not essential. As mentioned in Section 1.1, the factors that determine changes in the value of a piece of land are overwhelmingly outside the control of an individual landholder. This makes it efficient to tax increases in land values.

7. BITRE (2016).
8. Treasury (2010a); and BITRE (2015a).

Box 2: Developer charges are user charges

Developer charges are user charges designed to contribute a share of the costs of water, sewerage, electricity and communications infrastructure and local roads in greenfield developments. They are sometimes considered alongside value capture or as a form of value capture, although strictly speaking they are a fee for service rather than a tax.

However they do share one important feature of a tax on land value uplift: the charge is most likely to be borne by the landowner at the time the charge is determined. In effect, the charge is factored into the price a developer will be willing to pay for the land.[a]

Other than that similarity, developer charges are unlike value capture. They are set to recover a share of costs and not with any particular reference to the amount of land value uplift from a piece of infrastructure. There may in fact be no new piece of infrastructure, but simply a land release or zoning change.

An example of a developer charge that *is* similar to value capture is being planned for the Parramatta light rail, now under construction. A charge of around $200 per square metre of gross floor area is to be levied on new residential developments in a defined area,[b] with the stated intention of 'sharing the value uplift along the growth corridor', where development potential has increased as a result of the new line.[c]

It is entirely reasonable for governments to impose developer charges as a fee for service to connect new suburbs to water and power. But there are two drawbacks to using developer charges as a form of value capture. One is that they are poorly targeted. Because they are charged per property or per square metre of floor space, developer charges are a disincentive to develop land to its highest and best use. Owners of a factory or a large detached house may avoid the charge by not developing the property. Developer charges of this kind are more likely to have an anti-development effect than a value capture tax. The second drawback is that they are not especially fair, because they tax some windfall gains but not others.

a. Treasury (2010a, pp. 425–428).
b. Transport for NSW (2015).
c. Transport for NSW (2016a, p. 8).

1.2.3 Governments can use general revenues to reflect benefits to the community as a whole

Even after user charges and taxes on nearby landowners, new infrastructure may still bring benefits and value. These could be large or small, depending on the infrastructure. Typically the largest of these benefits is the reduction to congestion through the road system or the transport system as a whole. Any reduction in pollution and greenhouse gas emissions is also a benefit to the community as a whole.

These benefits to the community as a whole cannot be attributed either to users or nearby landowners, and so it is unfair for user charges and taxes on nearby landowners to fund that proportion of the infrastructure's benefits.

In the case of the Sydney CityRail network, these congestion and pollution benefits have been estimated to account for 72 per cent of the value, with the benefits to passengers at 28 per cent.[9] While some of the congestion and pollution benefit would go to landowners close to new infrastructure, much would also go to people who never went anywhere near the rail system.

1.3 How has value capture been used to this point?

Two iconic cases of value capture in Australia come up again and again: the Sydney Harbour Bridge (see Box 3) and the Melbourne City Loop (see Box 5 on page 14). The Gold Coast Light Rail is often cited as an example of value capture, but this is a stretch – the Transport Improvement Separate Charge is a general geographically-bounded tax rather than a tax on increased land value (see Box 4 on the following page).

9. IPART NSW (2012).

Box 3: Sydney Harbour Bridge

As well as being an iconic feat of engineering, with its 'coat hanger' design, the harbour bridge provided road and rail links between the two halves of Sydney, which were previously linked only by boat.

As part of the funding of the bridge, a betterment levy was imposed on landholders both north and south of the harbour whose holdings were likely to rise in value as a result of the bridge. The levy was imposed at a rate of "a halfpenny in the pound" (0.2 per cent) on the unimproved capital value of the properties, and was intended to raise one third of the cost of the bridge.[a]

During the Depression, the levy became politically difficult, and in 1932 it was decreased to one third of a penny in the pound (0.14 per cent),[b] before it was eventually repealed in 1937.[c]

In the end, the levy raised only about one sixth of the total cost of £6.25 million.[d] The shortfall in levy receipts was exacerbated by an overrun in the cost of the project (the originally announced cost was £5.5 million).[e]

Funding the bridge left NSW Government coffers in a precarious position. This expense, combined with the onset of the Depression, pushed the state to the verge of bankruptcy in 1932. Federal intervention led to the dismissal of the Lang Government.[f]

a. Sydney Harbour Bridge Act (New South Wales) (1922, Part II, Section 9); and Spearitt (2007, p. 109).
b. Sydney Harbour Bridge (Rates) Act (New South Wales) (1932).
c. Spearitt (2007, p. 116).
d. Infrastructure Australia (2016a, p. 9).
e. Infrastructure Australia (2016a, p. 9); and Sydney Harbour Bridge (1924, p. 51).
f. Legislative Assembly of New South Wales Public Accounts Committee (2014, p. 21).

The evidence suggests that passenger rail is the most viable candidate for value capture, but also that value capture schemes tend not to raise much money.

1.3.1 Urban passenger rail is the main candidate for value capture

Australian and overseas precedents suggest that value capture is most feasible in urban environments. This can be explained by the fact that demand for land is higher in cities. Rail projects, whether heavy or light, are the prime candidates for value capture, both in Australia (Table 1.1 on page 16) and overseas (Table 1.2 on page 17). Bridges have also been the source of value capture in a limited number of cases.

Although roads may cause land values to increase, the greater dispersion of the users makes it much more difficult to identify, even approximately, who the beneficiaries are. This greater dispersion reflects the very nature of car travel – that a person who lives at some distance from a new road may still be easily able to use it, and, related to this, that proximity to a major road is often seen as more undesirable than desirable.

It is a paradox of value capture that the type of infrastructure on which it can most effectively be imposed is exactly the same type where user charges are most feasible. It is relatively easy to exclude from both railways and bridges people who do not pay for their use. It is much harder to do so for roads.[10] As a consequence, most roads in Australia are neither subject to user charges nor likely to be subject to value capture taxes.

10. There are 16 toll roads in Australia, see (BITRE (2016)).

Box 4: Gold Coast Transport Improvement Separate Charge

The Gold Coast Transport Improvement Separate Charge is often cited as an example of value capture, although in truth, it is not designed to capture increased land value.

The Transport Improvement Separate Charge is a flat amount (currently $123) added to every annual rates bill in the City of Gold Coast.[a] Money raised is used 'to implement the City Transport Strategy, to expand the city's transport infrastructure and enhance its ability to meet the city's growing public transport needs.'[b]

No attempt is made to match the charge to land value uplift. For one thing, it is unlikely that all properties in the Gold Coast area experience value uplift as a result of the projects funded by the charge. The largest project the charge has contributed to funding is the Gold Coast Light Rail. However, even for such a significant project, land value uplift has only been clearly observed for properties within 400 metres of a stop, that is 1 per cent of Gold Coast properties.[c]

Also, even within areas that might experience land value uplift, it is very unlikely that the uplift will take the form of a flat dollar amount per property. Thus, a levy in the form of a flat amount per property is not based in any way on land value uplift.

It is more accurate to think of the Gold Coast Transport Improvement Separate Charge as a surcharge on municipal rates, hypothecated to be spent on various transport projects.

a. City of Gold Coast (2016, p. 70).
b. Ibid. (p. 5).
c. Murray (2016).

1.3.2 Value capture taxes have not raised much money

Experience shows that most value capture schemes raise at best a modest share of a project's construction costs. Value capture on rail projects in Australia and overseas has typically raised only 20 to 30 per cent of the project costs (see Table 1.1 on page 16 and Table 1.2 on page 17). The Melbourne City Loop betterment levy of the 1980s raised only 3 per cent of construction costs (see Box 5).[11]

1.3.3 Value capture works best with complementary land use and development changes

Governments can always set terms that complement new infrastructure and maximise its value, whether or not they also seek to capture some of that value through user charges and taxes. Such "joint development" practices include selling any government land that is no longer needed after construction, altering zoning rules on land in the neighbourhood of new infrastructure, and leasing space within government-owned buildings to commercial clients.

While not themselves defined as value capture policies, these practices can increase the capturable value of a piece of infrastructure. Table 1.3 on page 18 contains some examples of these joint development schemes, and shows that combining them with value capture taxes can yield up to the full cost of the project.

Box 6 on the next page expands further on one of the best known examples, the Hong Kong rail system. A similar model could be used in Australia on a smaller scale, but it would be unlikely to raise as much. For one thing, many parcels of land in Australia are privately owned, whereas the government owns all the land in Hong Kong, subject to

11. Eddington (2008); and Metropolitan Transit Authority (1985).

Box 5: Melbourne's City Loop

The City Loop is an underground rail circuit around Melbourne's central business district. It was completed between 1981 and 1985, and includes three new stations.[a]

A special city levy on properties in the Melbourne City Council area began in 1963, and was scheduled to last for 53 years.[b] However, it was scrapped in 1995, with the aim of cutting costs for CBD businesses.[c]

The levy was intended to deliver 25 per cent of the originally estimated cost of $80 million.[d] However, the contribution from the levy was never increased beyond $20 million,[e] while the actual project cost rose to $650 million.[f]

Before the loop opened, retail and office space was clustered around Flinders Street station to the south of the CBD. The loop helped to spread activity further north and enliven previously dormant parts of the city.[g]

a. Eddington (2008, p. 53).
b. Victorian DPCD (2012, p. 33).
c. Miscellaneous Acts (Omnibus Amendments) Act (Victoria) (1995, Section 59); and Stockdale (1995, p. 894).
d. Eddington (2008, p. 53).
e. Ibid. (p. 53).
f. Metropolitan Transit Authority (1985).
g. Mares (2012, p. 21).

long-term leases. Secondly, Hong Kong is much more densely populated than Australian cities: over seven million people live in a built-up area of around 285 square kilometres, compared with Sydney's population of four million in around 2000 square kilometres.[12] As a consequence, private vehicle transport is less attractive and access to mass transit more highly valued in Hong Kong.

Box 6: Hong Kong Mass Transit Railway

The Mass Transit Railway (MTR) network in Hong Kong is owned and operated by MTR Corporation Limited (MTRCL), a majority-government-owned company. MTRCL is able to build and operate the rail network without cash subsidies from the government, largely because of the income it gets from property development around stations.[a] Several models are used, including direct ownership, co-ownership or on-selling development rights.

The government pays no cash, but provides a subsidy by allowing MTRCL access to land around proposed stations. The government owns all land in Hong Kong, and extends long-term leases to individuals and corporations.[b] MTRCL pays the government an amount based on pre-transit land value.[c]

This can be thought of as the government procuring infrastructure via barter or payment in kind. Value is created by the proposed new rail stations. The government could continue to hold the land and capture the value directly. However, by allowing MTRCL access to the land at pre-transit values, the government is essentially choosing to give the land value uplift to MTRCL in exchange for MTRCL building the rail infrastructure.

a. Cervero et al. (2009).
b. Freemark (2010).
c. Ibid.

12. Demographia (2016, pp. 19–20).

Table 1.1: Australian value capture tax examples

					Value Capture			
Project or initiative	**Location**	**Mode**	**Year**	**Project cost (nominal)**	**Revenue (nominal)**	**% of cost**	**Source**	**Charge design**
Darling to Glen Waverley rail	Melbourne	Heavy rail	1930	AU£218k	AU£50k	23%	Betterment levy	Flat amount per acre, varying by proximity to new stations
Sydney Harbour Bridge	Sydney	Bridge	1932	AU£6.25m	AU£1m	16%	Betterment levy	% of unimproved land value
Melbourne City Loop	Melbourne	Heavy rail	1985	AU$650m	AU$20m	3%	Betterment levy	% of rateable value of commercial property
Parramatta light rail	Sydney	Light rail	2020				Developer charges	Flat amount per square metre of floor space on residential developments

Source: Eddington (2008, p. 53), Metropolitan Transit Authority (1985, p. 7), Transport Act (Victoria) (1983, Section 53), Sydney Harbour Bridge Act (New South Wales) (1922, Section 9), Infrastructure Australia (2016a, p. 9), Transport for NSW (2016a, p. 8), Transport for NSW (2015), O'Sullivan (2015), The Parliamentary Standing Committee on Railways (1926, pp. 4–5) and Waverley Historical Society (2016).

Table 1.2: Overseas value capture tax examples

					Value Capture			
Project or initiative	**Location**	**Mode**	**Year**	**Project cost (nominal)**	**Revenue (nominal)**	**% of cost**	**Source**	**Charge design**
Waterfront streetcar	Seattle	Light rail	1982		US$1.1m		Betterment levy	
Metro Rail Red Line – segment 1	Los Angeles	Metro rail	1993	US$1,450m	US$130.3m	9%	Betterment levy	Flat amount per square foot of land area
TECO Streetcar	Tampa (USA)	Light rail	2002	– – – – –	– – – – –	– – –	Betterment levy	% of assessed property value, exempting owner-occupied housing.
South Lake Union Streetcar	Seattle	Light rail	2007	US$52.1m	US$25.7m	49%	Betterment levy	Proportional to increase in probable market value for affected land parcels
Portland Streetcar	Portland (USA)	Light rail	2011	US$247m	US$34.4m	14%	Betterment levy	% of street frontage on streetcar route + % of property value.
West Dublin / Pleasanton BART	Pleasanton (USA)	Heavy rail	2011	US$106m	US$21m	20%	Developer contributions	Agreed contribution from two major developers
CrossRail	London	Heavy rail	2019	£14,800m	£4,700m	32%	Betterment levy, developer charges.	% of rateable value (*i.e.*potential annual rent)
Silver Line	Washington DC	Heavy rail	2020	US$5,684m	US$1,003m	18%	Betterment levy	% of property value.
Northern Line Extension	London	Metro rail	2020	£999m	£266m	27%	Developer contributions	
Contribucion de Valorizacion	Bogota, Medellin & other cities (Colombia)	Various					Betterment levies	Based on estimated land value increase. Also varies by ability to pay.

Notes: The betterment levy for the TECO Streetcar contributes to funding operating costs, rather than construction costs. The project's annual operating costs are around US$2 million and the levy's annual revenue is around US$400,000.

Source: Los Angeles County Metropolitan Transportation Authority (1994, pp. 7–13), APTA (2015, pp. 3–4), City of Seattle (2004), Seattle Streetcar (2007), Seattle Streetcar (2017), Mulady (2005), Dulles Corridor Metrorail Project (2017), Aratani (2015), Fairfax County Virginia (2015a), Fairfax County Virginia (2015b), Loudoun County Virginia (2012), City of Portland Bureau of Transportation (2009, p. 75), Multnomah County Board of Commissioners (1998), National Audit Office (2014, pp. 4, 24), PwC (2014, p. 25), Nine Elms London (2014), Transport For London (2013), Borrero Ochoa (2011), TECO Line Streetcar System (2013), TECO Line Streetcar System (2003, p. 8), Bay Area Rapid Transit (2011), Center for Transit Oriented Development (2008, p. 28), City of Seattle Office of Policy and Management (2005, p. 6) and Eskenazi (2008).

Table 1.3: Examples where value capture has been combined with joint development

Project or initiative	Location	Mode	Year	Project cost (nominal)	Revenue (nominal)	% of cost	Source of revenue
Midland Railway	Perth	Heavy rail	1894			100%	Land grants
Bennelong Bridge	Sydney	Bridge	2016	AU$63m	AU$63m	100%	Built by developers
Ormond Station	Melbourne	Heavy rail	2016				Sale of development rights
Sydney Metro	Sydney	Heavy rail	2024				Sale of development rights
Melbourne Metro	Melbourne	Heavy rail	2025				Sale of development rights
Transcontinental Railroad	USA	Heavy rail	1869			100%	Land grants
Airport MAX Red Line Light Rail	Portland (USA)	Heavy rail	2001	US$125m	US$28.2m	23%	Sale of development rights
Copenhagen Metro	Copenhagen (Denmark)	Heavy rail	2007				Land sales for development
Brightline	Miami – Orlando (USA)	Higher speed rail	2017	US$3,100m			Private development by rail company
HafenCity	Hamburg (Germany)	Rail and road	2025				Land sales for development
Railways	Tokyo	Heavy rail					Land readjustment
Hong Kong MTR	Hong Kong	Heavy rail					Grant of development rights
Urban and transit expansion	Taiwan	Various					Block land acquisition
Many small joint developments	Several cities (USA)	Various					Development

Source: Homebush Bay Bridge (2016), Transport for NSW (2016b, pp. 85–87), Sydney Metro (2017), Victorian DEDJTR (2016, pp. 249–256), Victorian DELWP (2016), Level Crossing Removal Authority (n.d.), Carey (2016), Carnamah Historical Society and Museum (n.d.), Xu (2015, pp. 22–29), Cervero (2009, pp. 23–25), Cervero et al. (2009), Lam et al. (1998, pp. 15–16), Zhao et al. (2012, p. 7), Linda Hall Library (n.d.), Newman (2016), Bach (2015), Bandell (2016), Morris (2016), Huxley (2009, p. 29), George Hazel Consultancy (2013, p. 29), TriMet (2012, pp. 1, 4), HafenCity Hamburg (2016) and Cervero (2004).

1.4 Tax Increment Financing

Some commentators champion the use of Tax Increment Financing (TIF). Their calls should go unheeded.

TIF schemes do not involve a new tax; rather, they are financing and hypothecation schemes (see Box 7 for more detail on the distinction between funding and financing). TIF schemes have been used in the US, with mixed success.[13]

TIF schemes use the expected increase in revenue from existing taxes, such as land taxes, that can be attributed to a new piece of infrastructure as security for finance on the infrastructure project. A private sector financier borrows the upfront capital for construction, and makes an arrangement with the government to earmark the expected increase in future revenue from existing taxes to guarantee the debt instrument(s) used to finance the project for a set period, such as 20 years (Figure 1.1 on the next page). The risk with TIF schemes is that they often include some form of guarantee that leaves the government ultimately liable if the scheme raises insufficient revenue to repay the loan.

TIF is essentially a contrivance for governments that are less creditworthy than an Australian state government (which is why some US local authorities have embraced the mechanism) or that wish their voters to believe that the government is opposed to borrowing (while paying over the odds for finance that is hidden from clear view).

The sole advantage of TIF schemes is their marketing appeal to the general community, and the essence of this appeal is the hypothecation, or earmarking, of a revenue stream to a specific local piece of infrastructure. However, this appeal is specious: a current or future government has the legal power to overturn a hypothecation scheme just as easily as the original government introduced it.

13. Infrastructure Australia (2016a, p. 18); and Infrastructure Victoria (2016, p. 72).

Box 7: Financing isn't funding

Funding and financing are often conflated.

Funding is the ultimate source of payment for infrastructure. Put simply, the options for funding public infrastructure are user charges, such as tolls on roads or fares on public transport, or government revenue, raised via taxation or asset sales.

Most funding for transport infrastructure comes from the community through general taxation.

Financing is the method of obtaining the money to pay the upfront investment costs of the infrastructure. Investments in public infrastructure can be financed from existing government revenues, government borrowing, or private finance. There is an enormous variety of financial instruments that make use of debt, equity and hybrids of the two.

Obtaining financing does not preclude the need for funding. That is, money can only be borrowed if there will be some way to pay it back in the future.

Australia should avoid TIF schemes for two reasons: because Australian states do not have difficulty raising finance cheaply, and because TIF schemes generally do not improve risk management. The rest of this section explains in more detail why TIF schemes should be rejected.

1.4.1 Australian states do not have difficulty raising finance cheaply

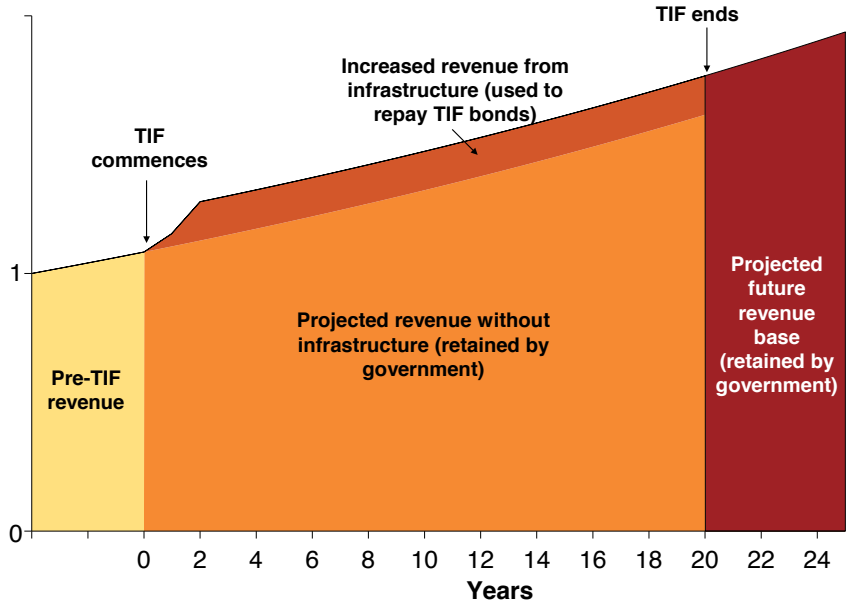
TIF schemes in the Australian context would involve state governments engaging a private sector firm to borrow against the future revenue streams expected from building and operating a new piece of infrastructure. The borrowing would be tied to the particular infrastructure project, but without the lender assuming construction or operating cost risk, and perhaps not even the tax revenue risk.

But Australian governments can finance projects more cheaply by selling general government bonds. All Australian states have strong credit ratings and can borrow money at historically low rates of interest (Figure 1.2 on the following page).

General government borrowing is cheaper than TIF borrowing because general government debt is serviced by all government revenues, which are inherently less risky than a specific revenue stream associated with a single project. Ultimately, general government debt is underwritten by the state's power to raise taxes. Specific project revenue streams are not, and therefore investors will demand higher compensation (in the form of interest rates) to invest in them.

The only situation where loans that are secured by project-specific revenue streams are not riskier is when the government provides a guarantee, in which case it is hard to see the point of the TIF scheme. From the state's perspective, such debts are part of its overall obligations, but from the investor's perspective, the instrument is more costly

Figure 1.1: How Tax Increment Financing works
Annual revenue, relative to starting year



to negotiate and less liquid than a general government bond and so will still be more expensive than general government borrowing.

When a private operator borrows the capital cost of a public infrastructure project, they often do so in the form of A- and BBB-rated corporate bonds. These entail interest rates about 1.3 to 2 percentage points higher than government borrowing costs (Figure 1.2).[14]

By way of illustration, if the NSW Government used private finance rather than its general government debt for a $1 billion project, it would pay an extra $20 million a year in interest.[15]

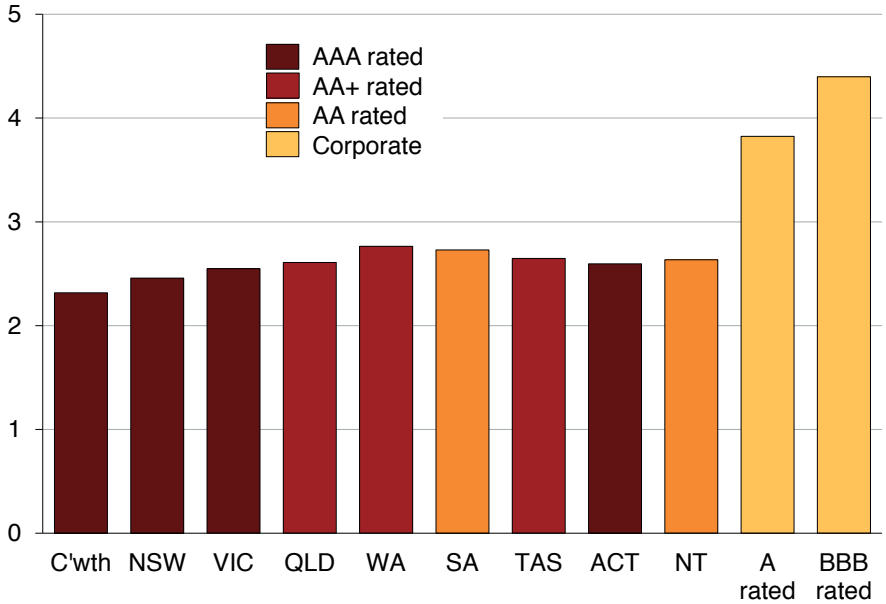
For an Australian state to raise capital in any way other than general government borrowing is to needlessly line the pockets of financiers and their advisers, except where a genuine and commensurate shift of risk to the financier can be made.

1.4.2 TIF schemes generally do not offload project risk

Infrastructure projects have cost and revenue risks, and complex projects are particularly risky.[16]

In principle, if finance borrowed by the private sector is used for an infrastructure project, the higher costs outlined in the previous section could buy some advantages. The idea of private sector involvement in public infrastructure is that each important risk can be allocated to the party best equipped to manage it, leading to a more efficient outcome

Figure 1.2: States can borrow cheaply
Yield on fixed income bonds maturing in 2022, per cent



Notes: Yields are current at 1 March 2017. Government bond yields represent the mid-point between ask and bid yields. Coupon rates are the closest to 6% issued by each government (5.75% for Commonwealth, 6% for NSW, VIC and QLD, 2.5% for WA, 1.5% for SA, 4.25% for TAS and ACT, 6.06% for NT). Yields for non-financial corporate bonds (A- and BBB-rated bonds) calculated based on spread above Commonwealth Government borrowing costs at 28 February 2017. Ratings are current at 1 March 2017. Ratings are those of S&P Global, except NT, which is rated Aa2 by Moody's (approximately equivalent to S&P's AA rating).

Source: Bloomberg (2017), RBA (2017), Australian Office of Financial Management (2016), NSW Treasury (2016), Victorian DTF (2016), Queensland Cabinet (2016), Western Australian Treasury Corporation (2016), Nicholson (2015), Gutwein (2016), Raggatt (2016) and Moody's (2016).

14. Bank finance also plays an important role, particularly during the construction phase when project risks are largest. Interest rates on bank-finance project loans are typically higher than corporate bonds in the early stages of the project, reflecting the higher risks in the construction and early-operation phases, but are similar to corporate bonds once the infrastructure asset is established. See Yescombe (2007, p. 152) and Productivity Commission (2013, p. 192).
15. Based on an assumption of borrowing costs 2 percentage points higher on a NSW bond yield of 2.46 per cent.
16. Terrill et al. (2016a, pp. 30–31).

than if all the risks were handled by the public sector. For instance, public-private partnerships that bundle construction with 30 years of maintenance arguably create an incentive to cost-efficiently balance the upfront expense with the ongoing obligation.

But there is a distinction between the private sector assuming the risk and management responsibility for construction and operations on the one hand, and private sector involvement in the channelling of finance on the other.

The potential benefits of private sector involvement rely on well-specified contracts that are enforced. Although Australia does not have a history of TIF schemes to point to, the more general case of Public Private Partnerships for major infrastructure projects reveals a mixed history. A Monash-CSIRO study points to a number of failed Public Private Partnerships where the public sector ended up contributing funds to the failed project, including:[17]

- The Sydney Airport Link Company went into receivership in 2000, and was put up for sale in 2006. The cost to taxpayers was more than $1 billion in today's dollars.
- The redevelopment of Melbourne's Southern Cross Railway Station in the 2000s fell behind schedule and over budget. The additional cost to the public sector was $166 million in 2016 dollars.
- Sydney's Lane Cove Tunnel suffered a series of setbacks, including most famously the collapse of a ventilation tunnel while under construction in 2005. The company that was to have operated the tunnel concession until 2037 went into receivership in 2010. The cost to taxpayers was $32 million in 2016 dollars.

If the risks are not transferred effectively, the government does not get what it paid for.

Australia is by no means unique in failing to effectively transfer risk. Lawyers and consultants were paid millions of pounds in fees for contracts to modernise London's underground rail network. But the arrangements unravelled when one of the two principal companies, Metronet, failed. Metronet's extensive borrowings were guaranteed by an American bond insurer – on the basis that 95 per cent of payments would be met by the UK government. In other words, the real borrower turned out to be the UK government – despite the unnecessarily expensive interest rate and fees.[18]

TIF schemes have two other important risks. One is that the longer a TIF scheme lasts, the greater the risk that the tax revenues deviate from the original forecast. The second is that they may simply tax value that is transferred from somewhere else, rather than value that is created by the new infrastructure.

Recommendation 1

Governments should fund transport infrastructure by the fairest and most efficient combination of the only two funding sources:

1. User charges, and
2. Taxes (whether taxes on land, including value capture taxes, or general revenue).

17. Bianchi et al. (2016).

18. Kay (2015, p. 159).

2 Many projects, one mechanism

All infrastructure projects are different, and their impacts on land values can vary significantly.

But it is dangerous to reach for bespoke value capture solutions for each project. This can increase the cost and complexity of a value capture scheme, and it creates opportunities for rent-seeking and corruption.

To manage the tension between individual project characteristics on the one hand and the risks of bespoke solutions on the other, governments can legislate a value capture framework. A value capture framework would define which projects are eligible for value capture, how taxes will be assessed, the tax rate and which agency will be responsible for managing the program.

This chapter outlines the ways in which infrastructure projects differ, the problems of bespoke design and a practical way to mitigate the main risks.

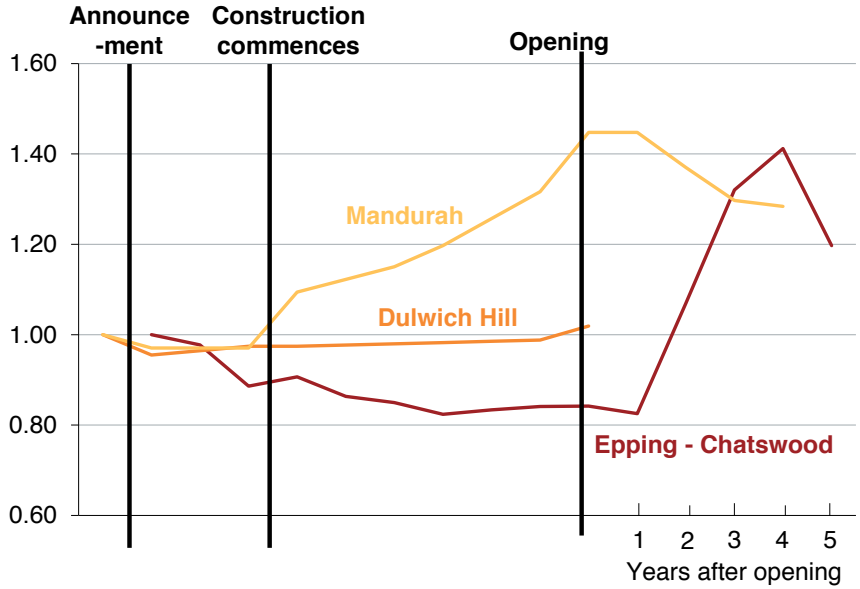
2.1 All infrastructure projects are different

The impact on land value differs from project to project: when it goes up, by how much, the difference that the transport mode makes, and the size of the land value increase relative to the construction costs. This section explains these four dimensions in more detail.

2.1.1 Land value changes can happen early or late in the project

Land value often increases as soon as a project is announced. But not always. Sometimes the increase happens during construction, and in some cases not until after the infrastructure is open.

Figure 2.1: Value uplift happens at different times of development
Proportional variation in price of land within 400 metres of a stop or station, after controlling for other factors. Index = 1 around time of announcement



Notes: Analysis uses "hedonic pricing models" which isolate how specific attributes of a land parcel (for example, topography, proximity to infrastructure, zoning rules) affect value. The time scale prior to opening has been scaled so that key milestones in each project's life cycle can be compared.

Source: LUTI Consulting (2016) and McIntosh et al. (2014a).

The variation in timing of value uplift makes it difficult to design a value capture scheme. Figure 2.1 on the preceding page illustrates timing differences for land in the immediate vicinity of new stations for several Australian projects: the Epping to Chatswood railway line in Sydney, the Dulwich Hill light rail extension, also in Sydney, and the Mandurah railway line link to Perth.

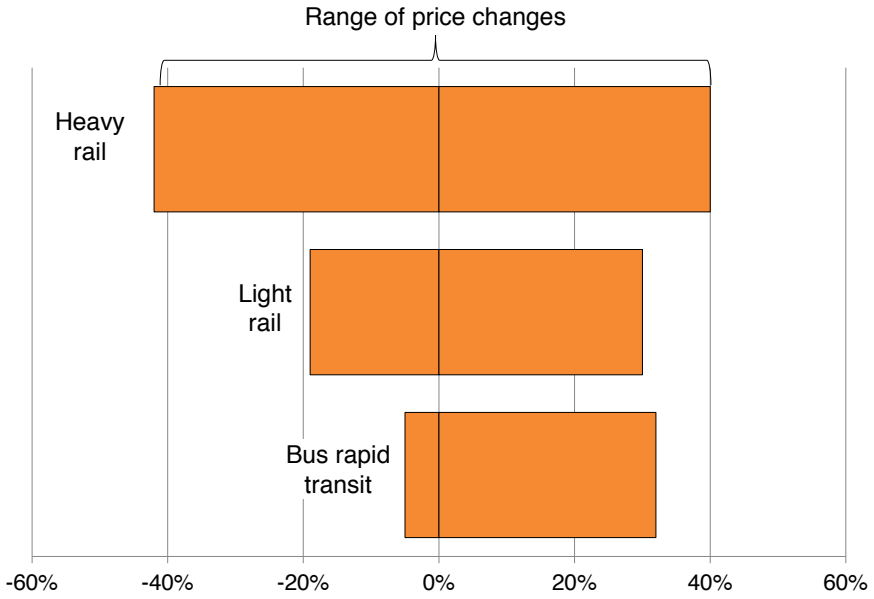
- The Epping to Chatswood line connects two previously existing radial rail lines, and provides a second rail route to the CBD from Epping. Construction began in November 2002 and the line opened in February 2009. It is fully underground, 12 kilometres long, and has three new stations in middle suburbs. Transit-oriented planning controls have been introduced around the new stations.[19]
- The Dulwich Hill light rail, an extension of the Inner West Light Rail Transit, was built between 2012 and 2014. Before then, the line had stretched from Sydney's Central Station to Lilyfield. The extension took the line from Lilyfield to Dulwich Hill.[20]
- The Mandurah railway is a suburban line running south from Perth to Mandurah along the route of the Kwinana freeway. Construction began in February 2004 and the line opened in December 2007. It is 72 kilometres long and has 11 new stations.[21]

2.1.2 Land value changes can be big or small

A new piece of infrastructure is likely to result in big land value increases only if it makes the property much more accessible. Even for a given piece of infrastructure, land value changes are not uniform: closer properties tend to be more affected than more distant ones.

Figure 2.2: The impact on land values ranges widely within transport modes

Observed change in affected land or property values, per cent



Notes: Ranges of price changes are based on a large sample of available studies from several countries, collated by the Bureau of Infrastructure, Transport and Regional Economics. The price change for some studies is land value and for others is property value. The range represents the range of average impacts from different studies. The range of uplifts observed for individual properties is likely to be larger. Roads are not included, due to insufficient road studies being available. The beneficiary catchment for road projects is generally less clear than for rail and bus, and benefits from road projects are more likely to be diffused.

Source: BITRE (2015b, p. 3).

19. LUTI Consulting (2016).
20. Ibid.
21. Carpenter et al. (2007).

For instance, Perth's Mandurah rail line created significant land value increases close to the new stations, in large part due to the speed of the service, as well as the high fuel and parking costs, and congestion on the competing Kwinana freeway.[22]

Figure 2.2 on the previous page shows how different projects around the world vary in their impact on land values.

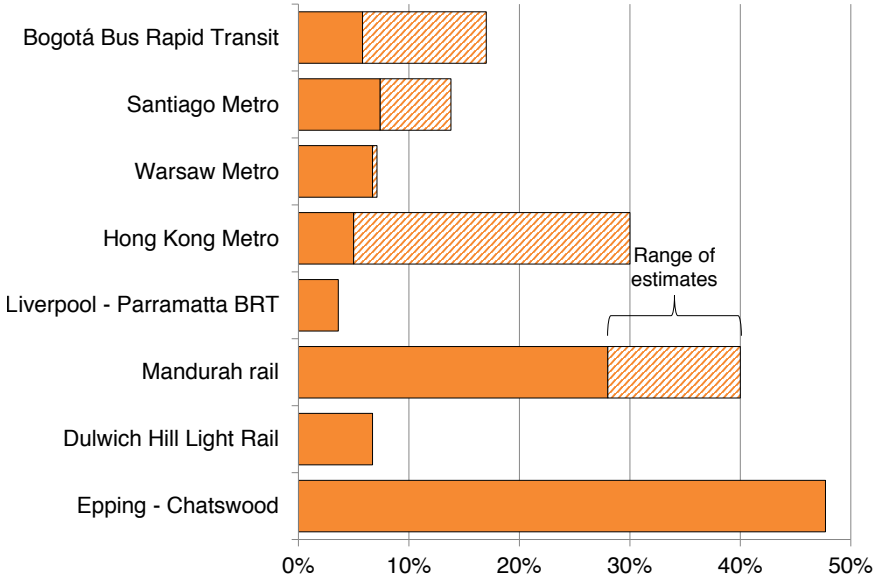
Figure 2.3 shows some of the variation in land values attributed to specific major infrastructure projects.

Land value uplifts in one area may simply reflect transfers from another area. For instance, if a town bypass is built on a country highway, travellers between major cities have a quicker trip but the impact on the town's businesses can be devastating.

Comparing the Epping to Chatswood line and the Dulwich Hill light rail extension illustrates the variability in land value uplift from infrastructure. Land within 400 metres of the new stations on the Epping to Chatswood line was estimated to have increased in value by 48 per cent due to the new infrastructure, whereas on the Dulwich Hill light rail the increase was estimated to be 7 per cent.[23] This reflects people's preference for faster heavy commuter rail over light rail, particularly when the existing heavy rail network is more extensive than the light rail network.[24]

Figure 2.3: The impact on land values varies markedly from project to project

Uplift in affected land or property values estimated to be attributable to the infrastructure, per cent



Notes: Studies on Bogotá Bus Rapid Transit, Santiago Metro, Warsaw Metro, Hong Kong Metro and Liverpool-Parramatta Bus Rapid Transit were based on property values. Studies on Dulwich Hill Light Rail, Epping-Chatswood and Mandurah rail were based on land values.

Source: LUTI Consulting (2016, pp. 61, 68), McIntosh et al. (2014b, p. 338), Mulley et al. (2013, p. 13), Medda et al. (2011, p. 7), Calvo et al. (2007, p. 22), Cervero et al. (2009, p. 1) and Agostini et al. (2008, p. 1).

22. McIntosh et al. (2014a) and McIntosh et al. (2013).
23. The uplift estimates are from LUTI Consulting (2016). Each can be observed in Figure 2.1 on page 23 as the ratio of the final figure in the time series to the lowest point in the series. The Dulwich Hill uplift may be understated. The research used land value increases up to one year after commencement of light rail operations. It is reasonably likely further value increases would have been observable after this point. The Epping-to-Chatswood study observed value increases up to four years after opening.
24. Mohammad et al. (2013, p. 166).

A material change in accessibility may not be sufficient to bring about a material change in land values.

2.1.3 Urban passenger rail projects generally have the most concentrated impact on land values

A new piece of infrastructure can have a concentrated impact in a small area, or a dispersed impact across a larger area. The impact from urban passenger rail is typically the most concentrated.

New passenger railway stations and links make the surrounding areas more accessible, so land prices are likely to increase, especially within walking distance of a station.[25] Even country towns could see land values increase if a sufficiently reliable and affordable transport link puts them within feasible commuting time from a major city.

By contrast, the impact of a new road or increased capacity on an existing road is generally more dispersed. This is because new roads generally do not make a big difference to an area's accessibility: most areas are already connected by road, and it is inherent to car travel that a walkable distance to a new road is not important – and may in fact be undesirable. The impact of a new road tends to be on the speed and reliability of a journey, rather than making new car journeys possible. By comparison, a new rail link makes new rail journeys possible.

Even if a road makes a big difference to a city, many of those benefiting are people passing through rather than those who own land nearby. So the benefits are likely to be diffuse, and the impact on the value of individual plots of land is likely to be modest.

Studies have found some road developments increase the value of industrial land.[26] But houses and shops near major new roads can suffer from increased noise, pollution and accident risk.[27]

Bus projects have had mixed impacts on land values. In Australia, even dedicated busway projects have mostly had only limited impacts on land values.[28] This may be because buses are a relatively minor component of urban travel in Australia, accounting for around 5 per cent of urban trips.[29] It may also be because people associate buses with noise and pollution.[30] Overseas, particularly in Latin America and Asia, bus rapid transit systems have resulted in greater land value uplift.[31] But in general, planners, funders and users tend to see bus infrastructure as less permanent than rail, meaning its impact on land values is more limited than rail's.[32]

2.1.4 Land value changes bear little relationship to construction costs

The success of value capture schemes is often measured by the proportion of construction costs they raise. However, there is little connection between the cost of construction and the value uplift that can be captured.

Firstly, only a portion of the total benefits of a project will be capitalised into local land values and thus be available for value capture. The amount able to be captured will depend on the geographic spread of benefits, as well as the level of user charges, if any.

25. Cervero et al. (2002); and Weinstein et al. (1999), cited in Mohammad et al. (2013).

26. SGS Economics and Planning (2012).
27. Zhang et al. (2015); LUTI Consulting (2016); McIntosh et al. (2014a); and Palmquist (1992).
28. Zhang et al. (2015); and Mulley et al. (2013).
29. Zhang et al. (2015, p. 9).
30. Ibid. (p. 9).
31. Stokenberga (2014).
32. Mulley et al. (2013, p. 2).

Secondly, the relationship between benefits and costs varies greatly between projects. For example, the Benefit-Cost Ratio (BCR) for the Forrestfield Airport Link in Perth has been estimated at 1.4,[33] while the BCR for the Main Road, St Albans Level Crossing Removal in Melbourne has been estimated at 0.8.[34] And far higher and much lower BCRs are not unusual.

The comparison between the Epping-to-Chatswood and Dulwich Hill projects, described above, illustrates that there is little connection between construction costs and value uplift that can be captured.

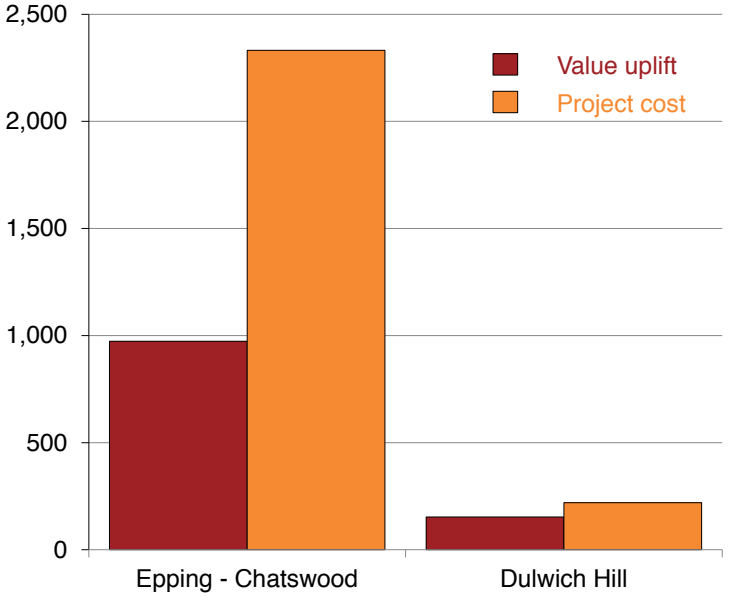
The uplift was much bigger in the vicinity of Epping-to-Chatswood than Dulwich Hill. Yet the total value uplift observed on the Epping-to-Chatswood line was 42 per cent of project costs, while for Dulwich Hill it was 70 per cent of project costs.

This divergence results from differences in costs and in uplift amounts (Figure 2.4). The construction costs for Epping-to-Chatswood were around $190 million per kilometre; for Dulwich Hill, they were around $40 million per kilometre. This reflects the fact that heavy rail is more expensive than light rail, and tunnelling costs more than surface construction.

The value uplifts for the two projects also took very different forms. Epping-to-Chatswood caused large increases in land values for a small number of properties nearby. Dulwich Hill caused much smaller increases in land values for a larger number of properties (because light rail has more frequent stops).

Although no value capture tax was imposed in these two projects, the amount of uplift observed can be used to illustrate the impact that a hypothetical value capture tax would have had. A value capture tax to capture 50 per cent of the value uplift over a five-year payment period

Figure 2.4: Land value uplifts have no relationship to construction costs
Estimated total land value uplift, project cost, $m



Source: LUTI Consulting (2016); NSW Treasury (2011); NSW Treasury (2014); Grattan analysis.

33. Infrastructure Australia (2016b).
34. Infrastructure Australia (2015).

would have resulted in annual bills of $45,000 on average for property owners near the Epping to Chatswood line, and $5,000 for those near the Dulwich Hill light rail (Table 2.1).

As a point of comparison, an extra tax of 0.5 per cent on the whole land value would have resulted in much lower tax bills for property owners near the Epping to Chatswood rail line. But it would also have raised much less revenue over five years: only 2.2 per cent of the construction costs of the line (Table 2.2).

2.2 Bespoke value capture mechanisms are risky

Even though every project is different, the arrangements for capturing value should not be. Governments should not design value capture schemes with different tax rates, different approaches to defining who is in the catchment, or different timing arrangements. Bespoke schemes are expensive to administer, unfair, and introduce the risk of rent-seeking and corruption. This section explains these shortcomings.

2.2.1 Bespoke schemes are costly

Every time a tax is introduced, it needs policy and legislation that covers all foreseeable circumstances, and systems to administer, monitor and report on it. If new value capture taxes are designed for individual infrastructure projects, the design and implementation of each one will have its own quirks and special characteristics.

Governments will spend more money on administration than they need to, and waste time and political capital getting special legislation passed.

2.2.2 Bespoke schemes are unfair

Bespoke schemes place at risk the most appealing characteristic of value capture – that it requires the windfall beneficiaries to pay more

Table 2.1: Collecting 50 per cent of attributable land value uplift over five years would result in very large bills for individual property owners near the Epping-Chatswood line

	Epping-Chatswood	Dulwich Hill
# properties	2,200	2,900
Average annual bill	$45k (4.8% land value)	$5k (0.7% land value)
Total raised	$487m	$77m
% of project cost	21%	35%

Source: Grattan analysis of LUTI Consulting (2016).

Table 2.2: Collecting 0.5 per cent of total land value annually for 5 years would capture very little of the value uplift for Epping-Chatswood

	Epping-Chatswood	Dulwich Hill
# properties	2,200	2,900
Average bill	$4,700	$3,900
Total raised	$51m	$57m
% of project cost	2.2%	26%

Source: Grattan analysis of LUTI Consulting (ibid.).

than people who do not benefit. Applying different taxes to landowners in similar circumstances is unfair.

Some fairness problems are unavoidable, for example different treatment of landowners just inside and just outside a boundary. However, bespoke schemes add an avoidable fairness problem.

2.2.3 Bespoke schemes create opportunities for rent-seeking and corruption

Government schemes that are tailored to local conditions on a case-by-case basis expose governments to rent-seeking by individuals and firms wanting commercial advantages. Landowners who are well organised and politically connected, and those in marginal electorates, are more likely to succeed in lobbying to influence the terms of value capture taxes in their area.

Even more concerning is the potential for corruption. The bigger the value capture tax, the greater the risk of collusion between landowners and politicians. A recent study of rezoning decisions in Queensland found that well-connected landowners owned 75 per cent of the land that was rezoned, but only 12 per cent of comparable land immediately outside the rezoning boundaries, indicating that these decisions were primarily driven by the relationship networks of the landowners, rather than technical assessments of the efficiency of urban expansion locations.[35]

A significant benefit of value capture generally is that, by reducing windfall gains to private individuals, it reduces incentives for individuals to seek political favours or engage in corrupt activities relating to specific projects. Adopting a bespoke approach would negate this benefit, by encouraging individuals to lobby for a scheme designed to favour them.[36]

35. Frijters et al. (2015).
36. Ibid.

Avoiding customised approaches is the foundation to mitigating these risks. Whenever there is wide discretion, there are risks that it will be used to favour those who offer benefits – from donations to re-election campaigns, to a lucrative job after politics, to straight-out bribes.

Governments should establish a standardised framework for value capture schemes, without scope for tailoring and customisation, and then operate them at arm's length.

2.3 A practical approach to mitigating the risks

Any government that decides to introduce value capture should mitigate as far as possible the risks of excessive cost, unfairness and corruption. It should do so by legislating for a standard approach to every complying project.

The legislation should specify the following characteristics:

- The minimum size of a project for it to be eligible;
- What authority will be responsible for defining the affected landowners – the beneficiary (or disadvantaged) catchment – and the methodology for doing so;
- Which types of infrastructure will be subject to the value capture tax – such as railway stations but not roads, or bridges but not hospitals;
- What authority will be responsible for assessing baseline and uplift values, and the methodology for doing so;
- The rules governing how the tax rate is set, including how it varies according to any user charges that are also in place;
- The arrangements for paying that proportion of a loss back to a landowner whose land value falls because of the new infrastructure;

- The schedule of when payments will be due;
- Eligibility conditions for applications to defer payment until sale or transfer of the property; and
- Appeal mechanisms.

The following chapter focuses on the optimal design of a value capture tax.

Recommendation 2

If a state government decides to go ahead with transport infrastructure value capture, it should pass general legislation that applies value capture to every transport infrastructure project with the following characteristics:

1. An identifiable beneficiary catchment;
2. Expected to make an area significantly more accessible; and
3. Large enough for the amount of revenue raised to substantially outweigh the cost of administering the scheme.

3 A well designed value capture tax

There are better taxes than value capture taxes, and Australians would be better off if their governments raised revenue in the most efficient, fair and simple way they can. This chapter explains in more detail the costs to the community of different tax bases.

But if governments do decide to proceed with value capture, there are better and worse ways of doing so. The first priority should be integrating the planning of new infrastructure with land use planning and zoning.[37] This chapter lays out how to design a value capture tax that state governments could implement according to the principles that should guide all tax design: efficiency, equity and simplicity, and further, that is as impervious to rent-seeking as possible.

A value capture tax should not be introduced as if there were no other taxes and charges in place. Figure 3.1 on the next page shows an estimate of the proportion of a one-off increase in land value that already accrues to governments' revenue over a 30-year period. Four of the five key taxes on land capture some of the uplift in value from a one-off increase, particularly for investor housing and commercial property.

The fifth key tax on land is council rates, which is not included in Figure 3.1 because a one-off land value increase will not increase overall revenue from this source. Each year, each council determines its revenue target according to its spending priorities. In NSW and Victoria, this revenue-targeting approach is formalised with a rate cap.[38] Thus, a one-off increase in land prices in one part of a council area will not lead to an increase in council revenue. Rather, there will be a shift in how much different ratepayers pay, while the overall revenue collected remains at the pre-determined level.

Figure 3.1 also highlights the fact that owner-occupiers pay a much smaller share of tax on a one-off increase in value than investors and owners of commercial property. This is because owner-occupiers are exempt from land tax and capital gains tax on their principal place of residence, and from GST on purchases of existing homes.[39] Owner-occupied housing accounts for 65 per cent of all land value, with tenanted housing making up 17 per cent, and commercial land 8 per cent.[40]

This chapter proposes a design for an efficient, fair and simple-to-administer value capture tax.

3.1 An efficient value capture tax

A value capture tax can be efficient; that is, it can have minimal impact on people's decisions about working, saving and investing. This should be a key design goal.

Like any well-designed land tax, an efficient value capture tax should be imposed on unimproved land value, with everyone's liability occurring at the same time, and without exemptions.

3.1.1 Unimproved land value

Unimproved land value is an efficient base because there is very little an individual landowner can do to alter it (see Section 1.1). Unimproved land value therefore isolates windfall gains from gains arising from the owner's actions, such as building or renovating.

37. Schmahmann et al. (2016); and Transport and Infrastructure Council (2016).
38. SGS Economics and Planning (2016, Appendix 1).
39. A New Tax System (Goods and Services Tax) Act 1999 (1999).
40. Grattan analysis of ABS (2016b, Table 61) and ABS (2015).

The only existing tax that isolates uplift value is the capital gains tax, although it does so on the total improved property value rather than unimproved land value. Stamp duty, GST, land tax and municipal rates all tax the entire land or property value rather than just the uplift amount.

Housing affordability is a potential concern whenever housing or land-related taxes are under consideration. However, a value capture tax as described in this chapter should not reduce housing affordability, although the new infrastructure will change the characteristics and desirability of a property.

Imposing a land value uplift tax would be expected to dampen the uplift in property values arising from the infrastructure improvement. Potential buyers would reduce the amount they were willing to pay by the future cost of tax payments. In other words, the tax liability would be capitalised into the property value.[41] This means the people who really paid the tax would generally be those who owned a property at the time the future tax liability was imposed.

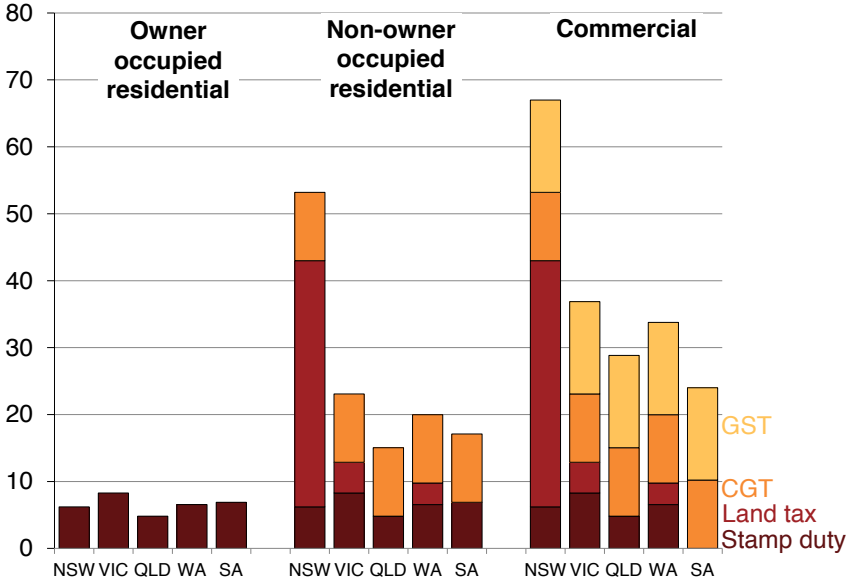
3.1.2 Everyone becomes liable at the same time

An external trigger for a tax liability is more efficient than one that arises from an individual's decision to buy or sell a property. This is because an external trigger does not permit an individual to take advantage of other circumstances to lower their tax liability, such as lowering their personal income or declaring a capital loss.

Figure 3.2 on the following page shows that taxes levied on land on a continuing basis distort individuals' and firms' decisions the least, whereas taxes levied on property turnover distort the system the most.

41. A body of work has looked at the impact of recurrent property taxes on house prices and found that they are generally capitalised into lower house prices, *e.g.* Oates (1969) and Palmon et al. (1998), cited in Davidoff et al. (2013).

Figure 3.1: Very little uplift is captured from owner-occupied housing
Proportion of a one-off land value uplift captured over 30 years, per cent



Notes: Rates based on median-priced residential properties in each capital city. Land tax rate assumes an average land holding similar to a median–priced residential property, and that land value is 65% of property value on average. Assumes inflation of 2.5%, discount rate 4.5%. Assumes 6% of properties are sold each year, based on Leal et al. (2017). WA land tax includes Metropolitan Region Improvement Tax, applicable to most areas of Greater Perth. The median-priced property in Brisbane or Adelaide is below the threshold for land tax, thus the incremental land tax shown for Queensland and South Australia is zero. In South Australia, stamp duty on commercial property is being phased out over 2015-2018. The zero stamp duty amount shown for South Australian commercial property is relevant to the period after 1 July 2018. The zero GST amounts shown for residential property are applicable to existing residences. New residential properties will be subject to GST. The GST amounts shown for commercial property are applicable to non-GST-exempt property sales, and are not adjusted for any input tax credit which may be claimed.

Source: Grattan analysis of ATO (2015); Leal et al. (2017); CoreLogic (2017) and Victorian Department of Treasury and Finance (unpublished).

Land tax and council rates capture some land value uplift, both with a continuing annual liability. Stamp duty, GST and capital gains tax, on the other hand, are triggered when a property changes hands.

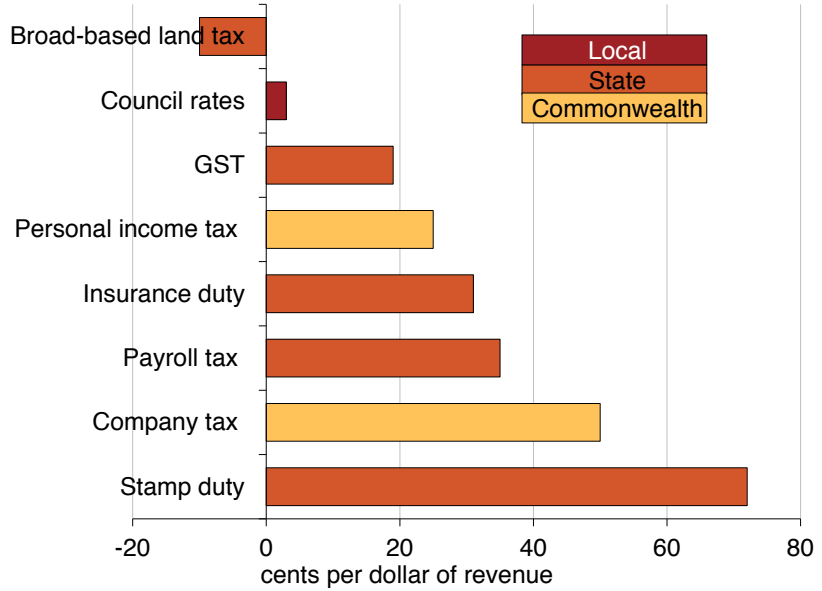
Taxes that are triggered by a property transaction make people less inclined to move. Such taxes have grown substantially in recent years. Capital gains tax revenues have increased from $1.7 billion in 1998-99 (before the introduction of the 50 per cent discount) to $4.8 billion in 2013-14.[42] NSW stamp duty thresholds have not been changed for 30 years.[43] But in this time the median Sydney house price has increased from $100,000[44] to more than $1 million,[45] meaning the rate of stamp duty on the median Sydney house has increased from 2 per cent to more than 4 per cent. It is not surprising therefore to see evidence of reduced mobility: in 2003, around 8 per cent of homes in Australia were sold, compared with around 5 per cent in 2016.[46]

In calculating a tax based on land value at a point in time, there is a risk that the uplift on which the tax is based may not reflect the price an owner achieves when they ultimately sell. The actual sale price will be affected not only by the land value but also by the buildings.

3.1.3 No exemptions

Taxes that are applied across the board tend to be more efficient than those with carve-outs, because people are less inclined to spend time and effort trying to avoid paying them. This is also a fairer approach. A value capture tax should be applied on all land within the catchment area of a new piece of infrastructure, regardless of who owns it or what is on it.

Figure 3.2: Taxes vary considerably in their efficiency
Marginal excess burden of key Australian taxes



Notes: Marginal excess burden is a measure of the costs to the community of people seeking to avoid the burden of taxation, for instance by working less to avoid paying income tax, or investing in a more lightly taxed asset than they otherwise would. The economic burden of broad-based land taxes is estimated to be negative, since the revenue from foreign owners of land would exceed the economic costs imposed on Australian residents. Most state "land taxes" are much less efficient because they are narrowly-based (excluding owner-occupied land and investor-owned land below a threshold) and have progressive rates.

Source: All marginal excess burden estimates are from Cao et al. (2015), other than council rates, insurance duty and payroll tax. Insurance duty and payroll tax are assessed in KPMG Econtech (2011), and council rates are assessed in KPMG Econtech (2010).

42. ATO (2016, Estimated tax on net capital gains, Table 1: individuals).
43. Property Council of Australia (2015).
44. Abelson et al. (2004, p. 8).
45. Domain (2017).
46. Leal et al. (2017, p. 21).

It is difficult to draw with any precision the geographic boundary of the catchment area of a new piece of infrastructure. While planners apply a rule of thumb that people will walk 800 metres to a train station and 400 metres to a bus, these guidelines are not well supported by empirical evidence.[47] To counter this imprecision, landowners whose land decreases in value or increases at a slower rate than would otherwise have occurred due to a new piece of infrastructure should receive a tax payment instead of a tax bill (see Section 3.2.2 on the next page).

Existing taxes that capture some land value uplift are full of exemptions and carve-outs. The principal place of residence, for example, is exempt from capital gains tax, land tax and GST. In particular, its exemption from capital gains tax amounted to a revenue reduction of $27.5 billion in 2015-16.[48] Most states exempt first home-buyers from paying stamp duty for properties under a threshold.

3.2 A fair value capture tax

A marvellous feature of a value capture tax is its fairness; if two people are in otherwise similar situations and one benefits from a new railway station or bridge, then a tax on some of their property value increase meets one common sense test of fairness. This type of fairness is known as “horizontal equity” as it relates to a specific project.

But value capture taxes cannot address the shortcoming of horizontal equity between projects; that is, because value capture taxes are best suited to infrastructure with a well-defined beneficiary catchment, they are best applied to urban passenger rail projects but less well-suited to taxing other forms of infrastructure such as schools, hospitals and monuments, whether new or old.

47. BITRE (2015b).
48. Treasury (2017, Item E5, p. 9).

Nor are value capture taxes well-suited to looking after the needs of poorer people relative to richer people, known as “vertical equity.” Ensuring that poorer people are not taxed too much is as a general rule most effectively handled by the tax-transfer system rather than by each individual tax or charge. To address vertical equity concerns, people with limited income should be able to defer payment until sale or transfer of the property.

For a value capture tax to be fair, it should not only accord with criteria legislated in advance, but there should also be a payment to the landowner rather than a liability if the infrastructure causes the value of some land parcels to fall, or to increase at a slower rate than had the infrastructure not been built. It should charge a set percentage of the value of the uplift, at a fixed rate. And people with limited income should be able to defer payment: a key vertical equity consideration.

3.2.1 Legislate standard criteria in advance

For a value capture tax to apply to all properties in the catchment on a consistent basis, state parliaments should legislate the criteria for value capture taxes and ensure the tax is administered without special deals or tailoring.

If value capture schemes are designed differently for each piece of infrastructure, some landowners will end up paying the tax while others in similar circumstances will not. Designing schemes one by one also gives individuals and businesses who may become liable for the tax an incentive to spend time, energy and money lobbying against it.

An example – Melbourne Metro rail

To explore some of the design considerations, we consider implementation of a hypothetical value capture tax on the Melbourne Metro project, which was announced in 2015 and is expected to be completed in 2025.

The intention is to limit the tax to property owners whose land increases in value by more than the average *due to the Melbourne Metro*. Above average uplift within a defined catchment area will be assumed to be attributable to the Melbourne Metro project, and taxed accordingly. Above average uplift outside the catchment will be assumed to be due to other factors, and will not be subject to the tax.

A typical approach is to define the catchment as all properties within walking distance of a station – around 800 metres. The boundaries should be set in advance but make sense: not stopping halfway along a short street, for example. These boundaries would need to be drawn *before* the government announced its intention to build the project. For example, the areas surrounding the five new stations – Arden, Parkville, CBD North, CBD South, and Domain – are clear candidates. All properties in each identified catchment would then need to be notified immediately that they may be liable for a value capture tax – the amount of which would not be known until the infrastructure is finished and operating.

If an affected property were to be sold at any time before the amount of the tax is determined, potential buyers would need to be made aware of the contingent tax. The sale price would be expected to adjust according to the expected size of the future tax bills.

The value capture tax would only be levied if the unimproved land value of each property inside the catchment increases by more than, say, 5 percentage points above the average for similar parts of Melbourne. The comparison points would be the unimproved land value in the year before the project was announced, and the value about one or two years after Melbourne Metro is opened.

To avoid the costs of conducting out-of-cycle official valuations, the value capture tax should be based on a routine official valuation done at least one full year after the project is opened. So, assuming 2026 is an official valuation year, the Melbourne Metro value capture charge would be based on the change in unimproved land values between 2014 and 2026, compared with the average for similar areas.

If the land value uplift of a property within the catchment was more than, for instance, 5 per cent larger than the average for comparable areas, the tax would then be calculated to capture a set proportion of the differential – say, 50 per cent. The tax would be payable over a period of perhaps five years, and so payable between 2027 to 2031.

Box 8 on the following page provides some similar details on London's CrossRail project.

3.2.2 A payment to the landowner if value is destroyed

Many transport projects create losers as well as winners. Landowners whose land decreases in value or increases at a slower rate than would otherwise have occurred due to a new piece of infrastructure should get a tax payment rather than a tax bill. If the argument for a value capture tax is prosecuted on the basis that those who gain should pay, then it is equally the case that those who lose should be paid.

An example is when a person's property is close to a new railway line, with the attendant noise and perhaps loss of a park, but between two stations and close to neither. Such a property could decrease in value due to the loss of amenity without commensurate gain.

If a piece of infrastructure has benefits to the community that are larger than its costs, it should be possible to tax the benefits, provide some compensation, and for the project still to have been worthwhile. Indeed, this is the standard by which projects should be judged.

3.2.3 Charge a proportion of value uplift

The fairest method is to charge a proportion of the land value uplift that is attributable to the new infrastructure. This explicitly targets landowners' windfall gains. Valuations performed by valuers-general could be

Box 8: London CrossRail

CrossRail is an addition to London's rail network, a line running from Reading in the west to Shenfield in the east. It includes ten new stations,[a] and will increase rail capacity in central London by 10 per cent.[b] Construction consists of 42km of new rail tunnel, and is due to be completed in 2019.[c] Of the £14.8 billion construction cost, £4.1 billion (28 per cent) is being raised from a Business Rate Supplement.[d] An additional £600 million (4 per cent) is being raised from developer charges.[e] The Business Rate Supplement is a levy on all commercial properties in Greater London with rateable value (that is, estimated annual rent) over £55,000.[f] This affects the largest 20 per cent of commercial properties.[g] The charge is equal to 2 per cent of estimated annual rent,[h] and will be in place for 30 years.[i]

The Business Rate Supplement targets businesses all over Greater London, not just those within walking distance of a station and thereby directly benefiting from new infrastructure. This mismatch between beneficiaries and those paying the tax limits the efficiency and equity of the value capture scheme. On the other hand, the broad geographic spread of the charge means a comparatively low rate can raise significant revenue. Also, there is some argument that CrossRail is "city-shaping" – that is, it may have a big impact on people's decisions about where they live and set up businesses, thus creating value across the city as a whole.[j]

Exempting small businesses and owners of residential property creates a further mismatch, because residential and small commercial properties close to CrossRail stations are just as likely as large commercial properties to increase in value.[k] But, of course, it would have been much harder, politically, to introduce a tax without these exemptions.

a. Crossrail (n.d.).
b. Medda et al. (2013).
c. National Audit Office (2014, p. 4).
d. Ibid. (p. 24).
e. Ibid. (p. 24).
f. Ibid. (p. 24).
g. PwC (2014, p. 25).
h. Ibid. (p. 25).
i. National Audit Office (2014, p. 25).
j. Schmahmann et al. (2016).
k. Between 2008 and 2015, residential property prices within a ten-minute walk of new CrossRail stations increased, on average, by 57 per cent, compared to 43 per cent growth in central London generally, see Knight Frank (2015).

used to estimate a property's land value uplift. This would be compared to the average for similar areas, and a proportion of the difference would be charged.[49]

There are some substantial practical difficulties associated with this method, which may explain why governments have not embraced value capture taxes to any great extent. For example, there would be uncertainty for landowners about the size of the tax bill they would receive. And for some projects, the uplift for a small number of properties would be very large, meaning it may not be politically feasible to charge a significant proportion of the uplift. An example of this is the Epping to Chatswood rail line (see Section 2.1.4 on page 26.

A second-best option would to be tax landowners in the area affected by a new infrastructure project based on the total value of their land, rather than on the value uplift created by the new project. While this has been a common structure for betterment levies (see Table 1.1 on page 16 and Table 1.2 on page 17), it lacks the appealing fairness of a tax based on value uplift.

3.2.4 Set a flat rate

A flat-rate tax is fair to landowners because everyone pays in proportion to the gain they receive.

Progressive rates make sense for personal income tax, but not for land taxes. To impose a progressive structure on the basis of the landowner's income would be to stack a second progressive structure on the existing one. To impose a progressive rates structure on the basis of the size of landholding would encourage landholders to have smaller holdings of land and invest more in other asset classes. This is how land tax operates in Australia: larger landowners face higher rates of tax than smaller landholders, with the result that few institutional investors invest in residential housing.[50]

For the same reason, a value capture tax should apply from the first dollar of land value uplift. A universal liability avoids the risk that people spend time and effort contesting liabilities that are close to a cut-off point.

3.2.5 Provide a deferred payment option

A substantial value capture tax could create difficulties for landowners who are asset rich but income poor. For example, an elderly person on a fixed income may struggle to pay the new tax, despite the increase in their wealth. A value capture tax needs to be designed so that it taxes people without causing undue hardship.

The solution is to permit a deferral of the liability until the property changes hands, on sale or on the death of the owner. Schemes of this kind already operate for council rates in South Australia, Western Australia and the ACT.[51] Interest should be charged on the balance to reflect the cost of deferral. A safety net might be provided by a stipulation that the debt cannot account for more than, say, 50, 75 or 100 per cent of the value of the property. This would protect landowners from longevity risks – where they live longer than expected and the debt comes to exceed the value of the property as interest charges compound over time.

3.3 A simple value capture tax

There are two ways to keep a value capture tax simple: take advantage of laws and processes already in place, which means enhancing or

49. Another option would be to employ hedonic pricing methods to obtain a more accurate estimate of the amount of land value uplift which is specifically attributable to the new infrastructure. However, this would add an unhelpful degree of complexity and would be difficult to explain to landowners.

50. Treasury (2010a, pp. 261–262).

51. Daley et al. (2015, p. 21).

building on a tax that is already collected; or stick to a standard, which means determining criteria to apply to all eligible projects and avoiding special exceptions. This section explains how to design a simple value capture tax.

3.3.1 Leverage the council rates base

The great advantage of the council rates base is that it includes almost all properties. Although rates are collected by local government, the valuations on which they are based are overseen by states' valuers-general. There is no reason that the council rates base cannot be used to collect a state-level tax.[52]

To leverage the council rates base would entail using states' property valuations, which are conducted every one or two years, in arrears. While these valuations are estimates, they are a well-established and broadly accepted element of the system of levying municipal rates and land taxes, and equally available for a value capture tax.

Some local government areas use capital improved value to calculate council rates.[53] In these areas, it would be preferable to move to unimproved site value (that is, land value) as a basis for a value capture tax.[54]

A second-best alternative would be to take the land tax base and add in principal places of residence.

3.3.2 Apply standard criteria

Standard, clear, specific and inflexible criteria for all eligible projects is important not only for fairness, as outlined above, but for simplicity of administration.

52. The council rates base is already used for state-wide property-based levies to fund fire and emergency services, see Daley et al. (2015, p. 17).
53. SGS Economics and Planning (2016, Appendix 1).
54. Treasury (2010b, p. 258).

3.3.3 Make the liability predictable

Landowners prefer to know the size of their liability, particularly if it is likely to be large. For this reason, a value capture tax should be imposed once, so that the size of liability is determined at a specified point after the infrastructure is open to general users. This does not prevent a payment schedule over, say, five years, to ease cashflow for landowners.

The tax's baseline valuation should be the valuer-general's valuation of the land in the full year before an official commitment, with funding, to the project.

The tax's "after" valuation should be at the end of the second full year of the project being open to general users. In some cases, value uplift will continue to accrue after this date. For example the Epping to Chatswood rail line resulted in uplift up to four years after opening (Figure 2.1 on page 23). However, setting a date two years after opening will generally capture most of the attributable uplift, and avoid undue delays in determining the amounts to be charged.

This valuation would also be conducted by the valuer-general, and would also be restricted to the unimproved land value. Of course, this is an estimated rather than an actual value, because the actual value can only be observed when a willing buyer pays a particular price at a particular time. But an estimate in arrears is a closer approximation of an actual price than an estimate in advance.

The difference between these two valuations would be compared to the change in land valuations over the same time period for more distant properties in otherwise similar areas.

3.4 Is a value capture tax better than a broad-based land tax?

Introducing a well-designed value capture tax is not easy. So far this chapter has identified in broad terms how to design a value capture tax

Table 3.1: How land value uplift is currently taxed

	Turnover taxes			Annual liability taxes		One-off liability
	Stamp duty	**GST**	**Capital Gains Tax**	**Land tax**	**Municipal rates**	**Well-designed betterment levy**
Base						
Uplift value only?	X	X	✔	X	X	✔
Unimproved value only?	X	X	X	✔	Varies by local govt	✔
Restrictions of base?	First home buyers exempt in some states	Domestic property exempt	Main home exempt; 50% discount on nominal gain	Main home exempt	X	Geographically bounded
Rate						
Refundable if downlift?	X	n/a	✔	X	X	✔
Flat rates structure?	X (Progressive on property value)	✔	✔	X (Progressive on owner's holdings)	✔ (Though minimums and flat charges apply for some councils)	✔
How often						
Tax liability trigger	Sale or transfer	Sale	Sale or transfer	Annual liability	Annual liability	Infrastructure opening (one-off)
Payment						
Who pays?	Purchaser	Purchaser	Seller	Owner	Owner	Owner
To which govt?	State	Commonwealth	Commonwealth	State	Local	State

that is as efficient, fair and simple as possible within the Australian state system as it stands.

In summary, the design outlined above is reasonably efficient; it could be considered as similar to land tax, although with the shortcoming that its geographical boundary could be disputed. It would have a strong claim to horizontal equity at the level of the project; in other words, the landowners benefiting from the infrastructure would contribute to its cost. However, it would not be as compelling on broader horizontal equity grounds, because landowners would be asked to contribute to a new railway link but not to a new hospital or museum. Nor would it be persuasive on vertical equity grounds, because people would be taxed on their land value uplift without regard to their capacity to pay. On simplicity grounds, value capture taxes are poor performers; there are many complications and the inevitable exemptions would only increase their complexity.

Value capture taxes are often compared with a broad-based land tax. Table 3.1 on the previous page summarises the ways in which land value uplift is currently taxed, including land tax. The following section explains how a broad-based land tax could work as an alternative to a value capture tax.

3.4.1 A broad-based land tax

A broad-based land tax is an alternative way to tax some of the land value uplift that results from government actions, particularly from the establishment of a new piece of infrastructure. The idea of a broad-based land tax has a long history in Australia. It became popular in the late 19th century and has recently experienced a renaissance due to its prominence in the Henry tax review of 2010. Most recently, Infrastructure Australia has argued that such a tax would be the best way to capture value from new infrastructure investments.[55]

55. Infrastructure Australia (2016a, p. 14).

A broad-based land tax is highly efficient, because land is an immobile tax base (Figure 3.2 on page 33). And while it would not zero in on the beneficiaries of a new piece of infrastructure, it would capture the effects of all infrastructure, old and new, as they translated into land values (as described in Section 1.1). This means it would satisfy a requirement of horizontal equity to a greater extent than a value capture tax, because it would treat people in similar circumstances in a similar way, even if the new infrastructure close to one person's home was a good candidate for value capture while that close to someone else's was not. Like a value capture tax, it would not address vertical equity concerns, and it is likely that a mechanism such as deferred liability would be needed for those who were asset-rich but income-poor. A broad-based land tax would be simpler to administer than a value capture tax, because there would be no requirement to police the geographic boundary of the catchment area.

State governments should therefore consider implementing a land tax with a significantly broader base than those currently in place. Most importantly, there should be no exemptions.

Recommendation 3

A value capture tax should be:

1. Applied to the actual amount of the uplift in land value on all properties in the catchment, compared to the average for similar areas;
2. Calculated on the basis of a comparison between the valuer-general's assessment of land value in the year before the first costed commitment to a project, and the land value at the end of the second full year after the project is opened to general users;
3. Applied at a flat rate with no tax-free threshold;
4. Made as a payment to the landowner rather than a bill in situations where the new infrastructure has a negative impact on land values; and
5. Imposed as a single liability, with predictable payments spread over about five years.

Recommendation 4

State governments should introduce a broad-based land tax, with no exemptions.

4 Is there a role for the Commonwealth in value capture?

The Commonwealth does not control the value capture tax base.

Nonetheless, the Commonwealth is pushing state and local governments to consider value capture opportunities in all future public infrastructure investments.[56] The Commonwealth is saying it will determine how much money it will give to a state or local government for infrastructure only after taking into account contributions made by the beneficiaries of land value uplift.[57]

This chapter outlines the limited scope for the Commonwealth to play any role in value capture. It begins by describing the Commonwealth's role in funding infrastructure, and how this may be substantially unravelled by the Commonwealth Grants Commission's method of allocating the GST among the states.

4.1 Commonwealth infrastructure funding is mostly unravelled by the Grants Commission assessment

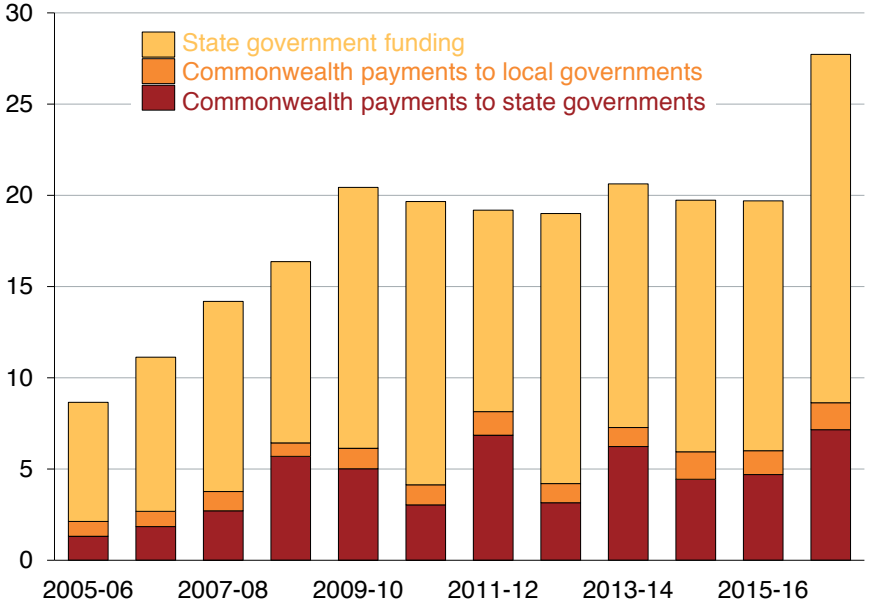
The Commonwealth does not itself build roads, railway lines, bridges, busways or tram routes. It contributes to such infrastructure by granting funds to state governments.

Most of these grants are known as National Partnership payments. They are governed by rules established by the Council of Australian Governments. National Partnership payments for transport infrastructure specify a dollar contribution for a specific project, and are reported each year in the Commonwealth's budget papers.

The Commonwealth's contribution to the states for transport infrastructure under National Partnership grants constitutes one quarter to one

Figure 4.1: The Commonwealth is a minority funder of transport infrastructure

Transport infrastructure spending, $billions, 2005-06 to 2016-17



Notes: Actual amounts used where available in following year's budget. Otherwise, budgeted amounts used.

Source: Grattan analysis of Commonwealth, State and Territory budget papers 2005-06 to 2016-17; Department of Infrastructure and Regional Development (unpublished).

56. DIRD (2016b, p. 39).
57. DIRD (2016c, p. 2).

third of states' spending on transport infrastructure (Figure 4.1 on the previous page). In 2015-16, this was $6.0 billion, and in 2016-17 it is forecast to be $8.6 billion. At present, NSW and Victoria are spending heavily on transport infrastructure, while some of the smaller states are spending below their long-term average.

Although the Commonwealth selects a suite of projects to fund each year, in many cases the decision is effectively unravelled by the processes of the Commonwealth Grants Commission. If a project is not on the National Land Transport Network, the Commonwealth's decision to fund it has no practical effect. This is because decisions to fund projects outside the National Network are included in Grants Commission calculations when it works out how to carve up the GST pool. It is as if the project funds were not given to the state, but added to the GST pool. The process could be thought of as:

> From each according to his ability, to each according to his needs.
> Marx (1875)

The effect is that if one state receives more than its share of off-network funding, it gets a smaller GST share over the following three years – that is, the GST distribution unravels the Commonwealth's funding decisions.

Off-network infrastructure includes urban passenger rail, urban arterial roads, urban local roads, and rural roads other than the major highway links. Value capture candidates are overwhelmingly in this category.

4.2 The projects where Commonwealth funding is not fully unravelled are generally not candidates for value capture

The type of project where the Commonwealth retains leverage are rarely candidates for value capture.

The Commonwealth retains some leverage for projects on the National Land Transport Network. These are the rural highways and railway

Figure 4.2: A significant portion of Commonwealth transport spending is washed out by GST payments

Average annual amount of Commonwealth transport infrastructure payments to state and local governments, by state, per capita, 2011-12 to 2014-15

Notes: The 'exempt from redistribution' 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 2011-12 to 2015-16; Department of Infrastructure and Regional Development (unpublished).

lines that link major cities and circle the country, as well as some key urban roads traversing capital cities and linking ports and airports with other centres. The National Land Transport Network is intended to be the road and rail networks that connect capital cities, major centres of commercial activity and inter-modal transfer facilities. It does not include urban passenger rail, which is where the greatest potential for value capture lies.

For National Network projects, half the funding is treated as outlined above – it is effectively unravelled because it is included in the calculation of how much GST the relevant state gets. But the other half is treated differently: it is quarantined, so it 'sticks where it hits'.

The effect is that National Network funding is more desirable funding for states than off-network funding, because it increases their overall funding. While half the National Network funding may be unravelled in the third, fourth and fifth years after the money is allocated, the other half is not (Figure 4.2 on the preceding page).

In addition to projects on the National Network, this same treatment applies to seven specific roads projects:

- Sydney's WestConnex
- East West Link in Melbourne, now cancelled
- The Western Sydney Infrastructure Plan
- Toowoomba Second Range Crossing
- Perth Freight Link/Roe Highway
- Adelaide's North-South Road Corridor
- The Northern Territory Roads Package

The then federal Treasurer, Joe Hockey, specified these projects for special treatment in December 2014.[58]

Even more special treatment applies to the $499.1 million given to Western Australia in the 2015-16 federal budget for "economic infrastructure projects".[59] This funding has no effect at all on GST distributions – the full amount sticks where it hits.[60]

The Commonwealth has little capacity to encourage value capture on National Network projects because such projects are poorly suited to value capture. As discussed in detail in Section 2.1, value capture candidates need a defined beneficiary catchment, which typically means urban public transport projects.

If the Commonwealth were to require states to pursue value capture, there is a danger that the states may choose projects based on their value capture potential rather than those with the greatest benefit to the community. Cost-benefit analysis is the best tool available to assess and select transport infrastructure projects.[61] Value capture can change who incurs the costs of a project, but not what those total costs are. Value capture cannot make a bad project good.

4.3 How can the Commonwealth ensure value capture is introduced?

The following section explores two ways in which the Commonwealth can bring about value capture: overhauling the Grants Commission's equalisation process; or by informal means, outside the usual policy mechanisms.

58. Commonwealth Grants Commission (2015, Supplementary terms of reference, p. x).
59. Treasury (2015, Budget Paper 2, p. 177).
60. Commonwealth Grants Commission (2016, Terms of Reference, p .vii).
61. Terrill et al. (2016b).

4.3.1 The Commonwealth would need to overhaul the Grants Commission's equalisation process

To make all infrastructure funding decisions stick where they hit would require a major overhaul of the Grants Commission process for determining states' GST shares.

There may be strong arguments for an overhaul of the system; certainly the states often express dissatisfaction with the current system.[62] But there are also strong arguments against wholesale changes to the machinery of federation, and to date, the latter arguments have prevailed.

But either way, it is far from clear that the Commonwealth should be able to set terms for infrastructure projects of a predominantly local type.

If the Commonwealth restricted itself to funding projects that meet its own agreed criteria for national importance, there would be a case for making those decisions binding by taking them out of the calculation of GST shares. The criteria agreed between the Commonwealth and the states for National Partnership funding are that:

- The benefits of the involvement extend nationwide or beyond the boundary of a single state; or
- There is a particularly strong impact on aggregate demand or sensitivity to the economic cycle, consistent with the Commonwealth's macro-economic management responsibilities; or
- The funding addresses a need for harmonisation of policy between the states to reduce barriers to the movement of capital and labour.[63]

62. For example, in light of falling resource royalties, members of the Western Australian and Commonwealth Governments have argued that the GST share Western Australia receives is inadequate, see Burrell et al. (2015) and ABC News (2016), although c.f. Colebatch (2015).
63. COAG (2011, Paragraph E21).

Although a major overhaul of federal financial relations could allow the Commonwealth to insist on value capture, the arguments for this are weak.

4.3.2 Otherwise the Commonwealth must rely on informal means

The Commonwealth's lack of formal levers does not prevent it from encouraging value capture through persuasion, deals or other informal means.

Informal levers are by their very nature hard to observe or evidence. One example where there appears to have been informal influence was the 2015-16 Commonwealth contribution to Western Australia for 'economic infrastructure projects', fully quarantined from affecting the distribution of the GST. It may be that informal reasons lie behind the relatively higher level of Commonwealth investment in New South Wales and Queensland than in Victoria or other states over the decade to 2014-15.[64]

It is difficult to make policy recommendations in respect of informal mechanisms.

The simplest, fairest and most efficient approach is for the Commonwealth to leave the states to decide whether value capture taxes are the best option available to them.

64. Terrill et al. (2016b).

Recommendations

1. Governments should fund transport infrastructure by the fairest and most efficient combination of the only two funding sources:

    a) User charges, and

    b) Taxes (whether taxes on land, including value capture taxes, or general revenue).

2. If a state government decides to go ahead with transport infrastructure value capture, it should pass general legislation that applies value capture to every transport infrastructure project with the following characteristics:

    a) An identifiable beneficiary catchment;

    b) Expected to make an area significantly more accessible; and

    c) Large enough for the amount of revenue raised to substantially outweigh the cost of administering the scheme.

3. A value capture tax should be:

    a) Applied to the actual amount of the uplift in land value on all properties in the catchment, compared to the average for similar areas;

    b) Calculated on the basis of a comparison between the valuer-general's assessment of land value in the year before the first costed commitment to a project, and the land value at the end of the second full year after the project is opened to general users;

    c) Applied at a flat rate with no tax-free threshold;

    d) Made as a payment to the landowner rather than a bill in situations where the new infrastructure has a negative impact on land values; and

    e) Imposed as a single liability, with predictable payments spread over about five years.

4. State governments should introduce a broad-based land tax, without exemptions.

References

A New Tax System (Goods and Services Tax) Act 1999 (1999). *A New Tax System (Goods and Services Tax) Act 1999*. https://www.legislation.gov.au/Details/C2014C00008.

ABC News (2016). "WA 'fleeced' by GST carve-up says Treasurer". *ABC News*. http://www.abc.net.au/news/2016-04-08/wa-treasurer-slams-gst-carve-up/7309644.

Abelson et al. (2004). Abelson, P. and Chung, D. *Housing prices in Australia: 1970 to 2003*. http://www.econ.mq.edu.au/Econ_docs/research_papers2/2004_research_papers/Abelson_9_04.pdf.

ABS (2015). *Microdata: Income and Housing, Australia, 2013-14*. 6541.0.30.001. Australian Bureau of Statistics. http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/6541.0.30.001Main+Features12013-14.

_____ (2016a). *Australian Demographic Statistics, June 2016*. 3101.0. Australian Bureau of Statistics. http://www.abs.gov.au/AUSSTATS/abs@.nsf/mf/3101.0.

_____ (2016b). *Australian System of National Accounts, 2015-16*. Cat. 5204.0. Australian Bureau of Statistics. http://www.abs.gov.au/ausstats/abs@.nsf/mf/5204.0.

Agostini et al. (2008). Agostini, C. A. and Palmucci, G. A. *The Anticipated Capitalisation Effect of a New Metro Line on Housing Prices*. http://onlinelibrary.wiley.com/doi/10.1111/j.1475-5890.2008.00074.x/pdf.

APTA (2015). *Value Capture for Public Transportation Projects: Examples*. American Public Transportation Association. https://www.apta.com/resources/reportsandpublications/Documents/APTA-Value-Capture-2015.pdf.

Aratani, L. (2015). "Silver Line phase 2: now arriving in 2020". *The Washington Post*. https://www.washingtonpost.com/news/dr-gridlock/wp/2015/04/30/silver-line-phase-2-now-arriving-in-2020/?utm_term=.a918dbc80613.

ATO (2015). *Taxation Statistics 2012-13*. Australian Tax Office. https://www.ato.gov.au/About-ATO/Research-and-statistics/In-detail/Tax-statistics/Taxation-statistics-2012-13/.

_____ (2016). *2013-14 taxation statistics*. https://data.gov.au/.

Australian Office of Financial Management (2016). *Australian Government Credit Ratings*. http://aofm.gov.au/credit-ratings/.

Bach, T. (2015). "Brightline, New Rail Link Between Miami and Orlando, Explained". *Miami New Times*. http://www.miaminewtimes.com/news/brightline-new-rail-link-between-miami-and-orlando-explained-8072257.

Bandell, B. (2016). "All Aboard Florida gets extension to obtain bond financing as construction moves ahead". *South Florida Business Journal*. http://www.bizjournals.com/southflorida/news/2016/01/14/all-aboard-florida-gets-extension-to-obtain-bond.html.

Bay Area Rapid Transit (2011). *BART riders celebrate grand opening of West Dublin/Pleasanton Station Saturday*. http://www.bart.gov/news/articles/2011/news20110218.

Bianchi et al. (2016). Bianchi, R., Drew, M. and Whittaker, T. *Determinants of Infrastructure/PPP Success or Failure*. CSIRO-Monash Superannuation Research Cluster Conference, 6th December 2016, Sofitel Hotel, Melbourne.

BITRE (2015a). *Introduction to road economics*. Unpublished staff paper by Dr Mark Harvey. Bureau of Infrastructure, Transport, and Regional Economics.

_____ (2015b). *Transport infrastructure and land value uplift*. 69. Bureau of Infrastructure, Transport, and Regional Economics. https://bitre.gov.au/publications/2015/files/is_069.pdf.

_____ (2016). *Toll roads in Australia*. 81. Bureau of Infrastructure, Transport, and Regional Economics. https://bitre.gov.au/publications/2016/files/is_081.pdf.

Bloomberg (2017). *Bond yield database*.

Borrero Ochoa, O. (2011). "Betterment Levy in Colombia: Relevance, Procedures, and Social Acceptability". *Lincoln Institute of Land Policy: Land Lines* (1), pp. 14–19. http://www.lincolninst.edu/publications/articles/betterment-levy-colombia.

Burrell et al. (2015). Burrell, A. and Martin, S. "Colin Barnett's 'tea party' revolt over GST". *The Australian*. http://www.theaustralian.com.au/national-affairs/treasury/colin-barnetts-tea-party-revolt-over-gst/news-story/8c4d9b1ea579dfb5d20813f6529e2b63.

Calvo et al. (2007). Calvo, P., Andres, J., Mendoza, C. A. and Mendieta-Lopez II, J. C. *Study of the Effect of the Transmilenio Mass Transit Project on the Value of Properties in Bogotá, Colombia*. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1586381.

Cao et al. (2015). Cao, L., Hosking, A., Kouparitsas, M., Mullaly, D., Rimmer, X., Shi, Q., Stark, W. and Wende, S. *Understanding the economy-wide efficiency and incidence of major Australian taxes*. Treasury. https://www.treasury.gov.au/~/media/Treasury/Publications%20and%20Media/Publications/2015/Working%20Paper%202015%2001/Documents/PDF/TWP2015-01.ashx.

Carey, A. (2016). "High-rises plans for suburban stations to help fund level crossing removals". *The Age*. http://www.theage.com.au/victoria/highrises-to-soar-over-suburban-stations-to-help-fund-level-crossing-removals-20160725-gqd3gi.html.

Carnamah Historical Society and Museum (n.d.). *Midland Railway*. http://www.carnamah.com.au/midland-railway.

Carpenter et al. (2007). Carpenter, A. and MacTiernan, A. *All aboard as the new Perth-to-Mandurah Railway begins*. https://www.mediastatements.wa.gov.au/Pages/Carpenter/2007/12/All-aboard-as-the-new-Perth-to-Mandurah-Railway-begins.aspx.

Center for Transit Oriented Development (2008). *Capturing the Value of Transit*. http://www.reconnectingamerica.org/assets/Uploads/ctodvalcapture110508v2.pdf.

Cervero, R. (2004). *Transit-Oriented Development in the United States: Experiences, Challenges, and Prospects*. 102. Transportation Research Board. http://www.trb.org/Publications/Blurbs/154989.aspx.

_____ (2009). *Urban Development on Railway-Served Land: Lessons and Opportunities for the Developing World*. https://trid.trb.org/view.aspx?id=919332.

Cervero et al. (2002). Cervero, R. and Duncan, N. "Transit's Value-Added Effects: Light and Commuter Rail Services and Commercial Land Values". *Journal of the Transportation Research Board* 1805, pp. 8–15. http://trrjournalonline.trb.org/doi/abs/10.3141/1805-02.

Cervero et al. (2009). Cervero, R. and Murakami, J. *Rail and Property Development in Hong Kong: Experiences and Extensions*. http://journals.sagepub.com/doi/abs/10.1177/0042098009339431.

City of Gold Coast (2016). *Revenue Statement and Resolution of Rates and Charges 2016-17*. http://www.goldcoast.qld.gov.au/documents/bf/revenue-statement-resolution-of-rates-2016-17.pdf.

City of Portland Bureau of Transportation (2009). *Portland Streetcar System Concept Plan*. https://www.portlandoregon.gov/transportation/article/321180.

City of Seattle (2004). *Council Bill Number: 114982*. http://clerk.seattle.gov/~scripts/nph-brs.exe?s1=&s3=&s4=&s2=&s5=licata%5Bspon%5D+and+%40dtir%3E20040000+and+%40dtir%3C20050000&Sect4=and&l=20&Sect2=THESON&Sect3=PLURON&Sect5=CBOR1&Sect6=HITOFF&d=CBOR&p=1&u=%2F~public%2Fcbor1.htm&r=10&f=G.

City of Seattle Office of Policy and Management (2005). *South Lake Union Streetcar: Capital Financing and Operating and Maintenance Plan*. http://ctod.org/pdfs/2005SouthLakeUnionStreetcarFinancing.pdf.

CLARA (2016a). *The CLARA plan*. http://www.clara.com.au/the-clara-plan.html.

CLARA (2016b). *Funding the CLARA plan*. http://www.clara.com.au/funding-the-clara-plan.html.

COAG (2011). "Schedule E: National Policy and Reform Objectives". *Intergovernmental Agreement on Federal Financial Relations*. Ed. by Council on Federal Financial Relations. http://www.federalfinancialrelations.gov.au/content/inter_agreement_and_schedules/current/schedule_e.pdf.

Colebatch, T. (2015). "The true story of Western Australia and the GST". *Inside Story*. http://insidestory.org.au/the-true-story-of-western-australia-and-the-gst.

Commonwealth Grants Commission (2015). *Report on GST Revenue Sharing Relativities — 2015 Review*. https://www.cgc.gov.au/index.php?option=com_content&view=article&id=219&Itemid=318.

_____ (2016). *Report on GST Revenue Sharing Relativities — 2016 Update*. https://cgc.gov.au/index.php?option=com_content&view=article&id=247&Itemid=497.

CoreLogic (2017). *CoreLogic Hedonic Home Value Index, December 2016 Results*. https://www.corelogic.com.au/news/capital-city-dwelling-values-surge-10-9-higher-over-the-2016-calendar-year.

Crossrail (n.d.). *Central and South East Stations*. http://www.crossrail.co.uk/route/stations/.

Daley et al. (2015). Daley, J. and Coates, B. *Property Taxes*. Grattan Institute. http://grattan.edu.au/report/property-taxes/.

Davidoff et al. (2013). Davidoff, I. and Leigh, A. "How Do Stamp Duties Affect the Housing Market?" *Economic Record* 89 (286), pp. 396–410. http://www.andrewleigh.org/pdf/StampDuty.pdf.

Demographia (2016). *Demographia World Urban Areas*. http://www.demographia.com/db-worldua.pdf.

Department of the Prime Minister and Cabinet (2016). *Smart Cities plan*. https://cities.dpmc.gov.au/smart-cities-plan.

DIRD (2016a). *Using value capture to help deliver major land transport infrastructure: Roles for the Australian Government*. Department of Infrastructure and Regional Development. http://investment.infrastructure.gov.au/whatis/Value-Capture-Discussion-Paper.pdf.

_____ (2016b). *The Australian Government's Response to Infrastructure Australia's Australian Infrastructure Plan*. Department of Infrastructure and Regional Development. https://infrastructure.gov.au/infrastructure/publications/files/Australian-Government-Response-to-Australian-Infrastructure-Plan_Nov-2016.pdf.

_____ (2016c). *Principles for Innovative Financing*. Department of Infrastructure and Regional Development. http://investment.infrastructure.gov.au/whatis/innovativefinancing.aspx.

Domain (2017). *Domain Rental & House Price Report: December Quarter 2016*. http://www.domain.com.au/product/wp-content/uploads/2017/01/DM15679_Domain_Rent_House_Report_December_2016.pdf.

Dulles Corridor Metrorail Project (2017). *FAQs*. http://www.dullesmetro.com/faqs/.

Eddington, R. (2008). *Investing in transport: East West Link Needs Assessment*. http://www.ycat.org.au/wp-content/uploads/2014/09/EWLNA_2008/Main%20Report/Investing%20in%20Transport%20East%20West.pdf.

Eskenazi, S. (2008). "Waterfront streetcar: Is it gone for good?" *The Seattle Times*. http://www.seattletimes.com/seattle-news/waterfront-streetcar-is-it-gone-for-good/.

Fairfax County Virginia (2015a). *FY 2016 Fairfax County Adopted Budget Plan: Fund 40110 Dulles Rail Phase I Transportation Improvement District*. http://www.fairfaxcounty.gov/dmb/fy2016/adopted/volume2/40110.pdf.

_____ (2015b). *FY 2016 Fairfax County Adopted Budget Plan: Fund 40110 Dulles Rail Phase II Transportation Improvement District*. http://www.fairfaxcounty.gov/dmb/fy2016/adopted/volume2/40120.pdf.

Fletcher, P. (2017). *Value Capture: Is There a Role for the Commonwealth?* Speech at Swissotel, Sydney. http://minister.infrastructure.gov.au/pf/speeches/2017/pfs002_2017.aspx.

Freemark, Y. (2010). *Hong Kong's Expanding Metro a Model of Development-Funded Transit*. The Transport Politic. http://www.thetransportpolitic.com/2010/12/14/hong-kongs-expanding-metro-a-model-of-development-funded-transit/.

Frijters et al. (2015). Frijters, P. and Murray, C. "Four ways we can clean up corruption in land rezoning". *The Conversation*. https://theconversation.com/four-ways-we-can-clean-up-corruption-in-land-rezoning-42557.

George Hazel Consultancy (2013). *Land Value Capture Discussion Paper*. http://www.metrolinx.com/en/regionalplanning/funding/Land_Value_Capture_Discussion_Paper_EN.pdf.

Gutwein, P. (2016). *Government welcomes Standard and Poor's judgement on the budget and economy*. http://www.premier.tas.gov.au/releases/government_welcomes_standard_and_poors_judgement_on_the_budget_and_economy.

HafenCity Hamburg (2016). *Facts and figures on HafenCity Hamburg*. http://www.hafencity.com/upload/files/artikel/Daten_und_Fakten_Fact_Sheet_EN_1.2_final.pdf.

Helm, T. (2015). *Land gains tax as value capture and tax reform*. Unpublished submission to South Australian tax review, April 2015.

Homebush Bay Bridge (2016). *Community Update - Number six: Bridge set for May 2016 opening*. http://www.homebushbaybridge.com.au/files/hbbb%20notification%205_brochure_web_apr16_mar16_final.pdf.

Huxley, J. (2009). *Value Capture Finance: Making urban development pay its way*. http://uli.org/wp-content/uploads/ULI-Documents/Value-Capture-Finance-Report.pdf.

Infrastructure Australia (2015). *2014-15 Assessment Brief: Main Road, St Albans Level Crossing Removal Project*. http://infrastructureaustralia.gov.au/projects/files/Vic-Main-Road-St-Albans-Level-Crossing-Removal.pdf.

_____ (2016a). *Capturing Value: Advice on making value capture work in Australia*. Infrastructure Australia. http://infrastructureaustralia.gov.au/policy-publications/publications/files/Capturing_Value-Advice_on_making_value_capture_work_in_Australia-acc.pdf.

_____ (2016b). *Project Business Case Evaluation: Forrestfield-Airport Link*. http://infrastructureaustralia.gov.au/projects/files/WA-Forrestfield-Airport-Link.pdf.

Infrastructure Victoria (2016). *Value Capture: Options, challenges and opportunities for Victoria*. Infrastructure Victoria. http://www.infrastructurevictoria.com.au/sites/default/files/images/IV18%20Value%20Capture%20Options_Final%20web_v2.pdf.

IPART NSW (2012). *Review of maximum fares for CityRail services from January 2013*. Independent Pricing and Regulatory Tribunal NSW. https://www.ipart.nsw.gov.au/files/sharedassets/website/trimholdingbay/final_report_-_review_of_maximum_fares_for_cityrail_services_from_january_2013.pdf.

Kay, J. (2015). *Other People's Money: Masters of the Universe or Servants of the People?* Profile Books.

Knight Frank (2015). *Crossrail: Analysing property market performance from Reading to Shenfield 2015*. http://content.knightfrank.com/research/520/documents/en/2015-2767.pdf.

KPMG Econtech (2010). *CGE Analysis of the Current Australian Tax System*. Commonwealth Treasury. http://www.taxreview.treasury.gov.au/content/Content.aspx?doc=html/commissioned_work.htm.

_____ (2011). *Economic Analysis of the Impacts of Using GST to Reform Taxes*. http://www.cpaaustralia.com.au/~/media/corporate/allfiles/document/professional-resources/taxation/kpmg-econtech-final.pdf.

Laird et al. (2001). Laird, P., Newman, P., Bachels, M. and Kenworthy, J. *Back on Track: Re-thinking Transport Policy in Australia and New Zealand*. University of New South Wales Press. ISBN: 9780868404110.

Lam et al. (1998). Lam, A. H. and Tsui, S. W.-c. *Policies and Mechanisms on Land Value Capture: Taiwan Case Study*. Lincoln Institute of Land Policy. https://www.lincolninst.edu/publications/working-papers/policies-mechanisms-land-value-capture.

Leal et al. (2017). Leal, H., Parsons, S., White, G. and Zurawski, A. "Housing Market Turnover". *RBA Bulletin*. March 2017, pp. 21–30. http://www.rba.gov.au/publications/bulletin/2017/mar/pdf/bu-0317-3-housing-market-turnover.pdf.

Legislative Assembly of New South Wales Public Accounts Committee (2014). *Planning NSW infrastructure for the twenty-second century*. Report 16/55 – June 2014. https://www.parliament.nsw.gov.au/committees/DBAssets/InquiryReport/ReportAcrobat/5326/Public%20Accounts%20Committee%20-%20Planning%20NSW%20Infrastru.pdf.

Level Crossing Removal Authority (n.d.). *North McKinnon Centre Level Crossing Removal Project*. http://levelcrossings.vic.gov.au/crossings/north-mckinnon-centre.

Linda Hall Library (n.d.). *The Pacific Railway: A Brief History of Building the Transcontinental Railroad*. http://railroad.lindahall.org/essays/brief-history.html.

Los Angeles County Metropolitan Transportation Authority (1994). *Benefit Assessment District Program Overview*. http://libraryarchives.metro.net/DPGTL/programs/1992_benefit_assessment_district_program_overview.pdf.

Loudoun County Virginia (2012). *Board of Supervisors Business Meeting Action Item – Dulles Metrorail Service Districts: Proposed Revisions*. https://www.loudoun.gov/DocumentCenter/View/78407.

LUTI Consulting (2016). *Transit and Urban Renewal Value Creation*. Luti Consulting. http://www.luticonsulting.com.au/wp-content/uploads/2013/12/Sydney-Transit-and-Urban-Renewal-Value-Creation-Report.pdf.

Manning, P. (2016). "Green fields and blue sky". *The Monthly* December 2016 - January 2017, pp. 56–63.

Mares, P. (2012). *Can we afford to get our cities back on the rails*. https://grattan.edu.au/wp-content/uploads/2014/04/180_mares_urban_rail_essay_cities.pdf.

Marx, K. (1875). *Critique of the Gotha Programme*. https://www.marxists.org/archive/marx/works/download/Marx_Critque_of_the_Gotha_Programme.pdf.

McIntosh et al. (2013). McIntosh, J., Newman, P. and Glazebrook, G. *Why Fast Trains Work: An Assessment of a Fast Regional Rail System in Perth, Australia*. http://dx.doi.org/10.4236/jtts.2013.32A005.

McIntosh et al. (2014a). McIntosh, J., Trubka, R. and Newman, P. "Tax Increment Financing Framework for Integrated Transit and Urban Renewal Projects in Car-Dependent Cities". *Urban Policy and Research* 33.1. DOI: 10.1080/08111146.2014.968246. http://dx.doi.org/10.1080/08111146.2014.968246.

McIntosh et al. (2014b) _____ . "Can value capture work in a car dependent city? Willingness to pay for transit access in Perth, Western Australia". *Transportation Research Part A: Policy and Practice* 67, pp. 320–339. http://www.sciencedirect.com/science/article/pii/S0965856414001736.

Medda et al. (2011). Medda, F. and Modelewska, M. *Land value capture as a funding source for urban investment: The Warsaw metro system*. http://s3.amazonaws.com/academia.edu.documents/5149107/lvc_as_a_funding_source_for_urban_investment.pdf?AWSAccessKeyId=AKIAIWOWYYGZ2Y53UL3A&Expires=1486087056&Signature=zfad5vZFITKBY09CkWLTfz1U72w%3D&response-content-disposition=inline%3B%20filename%3DLand_value_capture_as_a_funding_source_f.pdf.

Medda et al. (2013). Medda, F. and Cocconcelli, L. *To Tax or not to Tax: The case of London Crossrail: Presentation at STAREBEI Seminar*. https://www.ucl.ac.uk/qaser/pdf/publications/starebei5.

Metropolitan Transit Authority (1985). *Report of the Metropolitan Transit Authority for the year ended 30 June 1985*. http://www.parliament.vic.gov.au/papers/govpub/VPARL1985-87No61.pdf.

Miscellaneous Acts (Omnibus Amendments) Act (Victoria) (1995). *Miscellaneous Acts (Omnibus Amendments) Act 1995*. http://www.austlii.edu.au/au/legis/vic/hist_act/maaa1995379.pdf.

Mohammad et al. (2013). Mohammad, S. I., Graham, D. J., Melo, P. C. and Anderson, R. J. "A meta-analysis of the impact of rail projects on land and property values". *Transportation Research Part A* (50), pp. 158–170. http://www.sciencedirect.com/science/article/pii/S0965856413000207.

Moody's (2016). *Moody's downgrades the Northern Territory's rating to Aa2 from Aa1; changes outlook to stable*. https://www.moodys.com/research/Moodys-downgrades-the-Northern-Territorys-rating-to-Aa2-from-Aa1--PR_352507.

Morris, D. Z. (2016). "Even Fortress Capital Can't Privately Fund Passenger Rail". *Fortune*. http://fortune.com/2016/01/12/fortress-capital-florida-rail-funds/.

Mulady, K. (2005). "South Lake Union streetcar cost shocks neighbors". *Seattle Post-Intelligencer*. http://www.seattlepi.com/local/transportation/article/South-Lake-Union-streetcar-cost-shocks-neighbors-1184408.php.

Mulley et al. (2013). Mulley, C. and Tsai, C.-H. (*How much does new transport infrastructure add to land values? Evidence from the bus rapid transit system in Sydney, Australia*. https://trid.trb.org/view.aspx?id=1285285.

Multnomah County Board of Commissioners (1998). *Resolution No. 98-124: Supporting a Local Improvement District for the Central City Streetcar Project*. https://multco.us/file/10444/download.

Murray, C. K. (2016). *Land Value Uplift from Light Rail*. https://ssrn.com/abstract=2834855.

National Audit Office (2014). *Crossrail*. https://www.nao.org.uk/wp-content/uploads/2014/01/Crossrail.pdf.

Newman, P. (2016). "Australia needs to follow the US in funding urban rail projects". *The Conversation*. https://theconversation.com/australia-needs-to-follow-the-us-in-funding-urban-rail-projects-64666.

Nicholson, L. (2015). "SA maintains AA credit rating". *IN Daily*. http://indaily.com.au/news/business/2015/09/25/sa-maintains-aa-credit-rating/.

Nine Elms London (2014). *Northern line extension to Battersea gets the go-ahead*. http://nineelmslondon.com/news/northern-line-extension-to-battersea-gets-the-go-ahead.

NSW Treasury (2011). *State Budget Papers, 2011-12*.

_____ (2014). *State Budget Papers, 2014-15*.

_____ (2016). *NSW Triple-A Credit Rating*. http://www.treasury.nsw.gov.au/NSW_Triple_A.

Oates, W. E. (1969). "The Effects of Property Taxes and Local Public Spending on Property Values: An Empirical Study of Tax Capitalization and the Tiebout Hypothesis". *Journal of Political Economy* 77 (6), pp. 957–971. http://www.journals.uchicago.edu/doi/abs/10.1086/259584.

O'Sullivan, M. (2015). *Parramatta light rail line via Sydney Olympic Park gets green light*. http://www.smh.com.au/nsw/parramatta-light-rail-line-via-sydney-olympic-park-gets-green-light-20151207-glhxhg.html.

Palmon et al. (1998). Palmon, O. and Smith, B. A. "New Evidence on Property Tax Capitalization". *Journal of Political Economy* 106 (5), pp. 1099–1111. http://www.journals.uchicago.edu/doi/abs/10.1086/250041?journalCode=jpe.

Palmquist, R. B. (1992). “Valuing Localized Externalities”. *Journal of Urban Economics* 31, pp. 59–68. http://www.sciencedirect.com/science/article/pii/009411909290032G.

Productivity Commission (2013). *Public infrastructure*. http://www.pc.gov.au/inquiries/completed/infrastructure/report.

Property Council of Australia (2015). *Stamp duty analysis*. https://www.propertycouncil.com.au/downloads/propsignificance/Stamp_duty.pdf.

PwC (2008). *Tax Increment Financing to fund infrastructure in Australia*. http://infrastructureaustralia.gov.au/policy-publications/submissions/published/files/486_propertycouncilofaustralia_SUB2.pdf.

_____ (2014). *Crossrail 2: Funding and financing study*. https://www.pwc.co.uk/capital-projects-infrastructure/assets/crossrail-2-funding-and-financing-study.pdf.

Queensland Cabinet (2016). *More good news on Queensland’s credit rating*. http://statements.qld.gov.au/Statement/2016/10/19/more-good-news-on-queenslands-credit-rating.

Raggatt, M. (2016). “ACT credit rating unchanged, negative outlook remains”. *The Canberra Times*. http://www.canberratimes.com.au/act-news/act-credit-rating-unchanged-negative-outlook-remains-20160827-gr2pet.html.

RBA (2017). *Aggregate Measures of Australian Corporate Bond Spreads and Yields – F3*. http://www.rba.gov.au/statistics/tables/.

Schmahmann et al. (2016). Schmahmann, L. and Holloway, A. *Unlocking ’city shaping’ potential through integrated transport and land use planning*. http://www.aitpm.com.au/ArticleDocuments/288/AITPM%20paper_city%20shaping%20infrastructure_Laura%20Schmahmann_updated.pdf.aspx?Embed=Y.

Seattle Streetcar (2007). *Seattle Streetcar: Costs and Financing*. http://www.seattlestreetcar.org/about/docs/faqcosts.pdf.

_____ (2017). *Seattle’s Transit Master Plan & the Seattle Streetcar Network*. http://www.seattlestreetcar.org/network.htm.

SGS Economics and Planning (2012). *Long run economic and land use impacts of major infrastructure projects*. Department of Transport. http://www.sgsep.com.au/assets/Long-run-econ-and-LU-impacts-of-major-infrastructure-projects-SGS-2012-lores.pdf.

_____ (2016). *Technical paper on value capture*. http://infrastructureaustralia.gov.au/policy-publications/publications/files/SGS_Technical_paper_on_value_capture-September_2016.pdf.

Spearitt, P. (2007). *Sydney harbour Bridge: A Life*. New South Publishing. ISBN: 9781742233086.

Stockdale, A. (1995). *Miscellaneous Acts (Omnibus Amendments) Act 1995: Second reading*. http://www.parliament.vic.gov.au/images/stories/volume-hansard/Hansard%2052%20LA%20V426%20Oct-Nov1995.pdf.

Stokenberga, A. (2014). “Does Bus Rapid Transit Influence Urban Land Development and Property Values: A Review of the Literature”. *Transport Reviews* 34 (3), pp. 276–296. http://dx.doi.org/10.1080/01441647.2014.902404.

Sydney Harbour Bridge (1924). *Sydney Harbour Bridge: Report on Tenders*. https://sydney-harbour-bridge.bostes.nsw.edu.au/pdf_doc/SHB-tenders-complete.pdf.

Sydney Harbour Bridge Act (New South Wales) (1922). *Sydney Harbour Bridge Act 1922*. http://www.austlii.edu.au/au/legis/nsw/num_act/shba1922n28249.pdf.

Sydney Harbour Bridge (Rates) Act (New South Wales) (1932). *Sydney Harbour Bridge (Rates) Act 1932*. http://www.austlii.edu.au/au/legis/nsw/num_act/shba1932n52307.pdf.

Sydney Metro (2017). *Sydney Metro Project Overview*. http://www.sydneymetro.info/citysouthwest/project-overview.

TECO Line Streetcar System (2003). *Tampa’s TECO Line Streetcar System: Inventing the Future. Respecting the Past.* http://www.tecolinestreetcar.org/news/inventing_the_future.pdf.

TECO Line Streetcar System (2013). *Fiscal Year 2013 in Review for the Special Assessment District*. http://www.tecolinestreetcar.org/about/streetcar_assessment_district.pdf.

Terrill et al. (2016a). Terrill, M. and Danks, L. *Cost overruns in transport infrastructure*. Grattan Institute. http://grattan.edu.au/report/cost-overruns-in-transport-infrastructure/.

Terrill et al. (2016b). Terrill, M., Emslie, O. and Coates, B. *Roads to riches: better transport investment*. Grattan Institute. http://grattan.edu.au/wp-content/uploads/2016/04/869-Roads-to-Riches.pdf.

The Parliamentary Standing Committee on Railways (1926). *Report on the proposed Darling to Glen Waverley railway*. http://www.parliament.vic.gov.au/papers/govpub/VPARL1926No12RSC.pdf.

Transport Act (Victoria) (1983). *Transport Act 1983*. http://www.austlii.edu.au/au/legis/vic/hist_act/ta1983153/.

Transport and Infrastructure Council (2016). *National Guidelines for Transport System Management in Australia*. Stage 2 content for stakeholder consultation. F0.2 - Integrated Transport and Land Use Planning. https://ngtsmguidelines.files.wordpress.com/2016/03/ngtsm2016_f0-2_integrated_transport_and_land_use_planning2.pdf.

Transport For London (2013). *Northern Line Extension Factsheet 1: Funding and Finance*. http://content.tfl.gov.uk/nl-factsheet-i-web.pdf.

Transport for NSW (2015). *Making it happen in Western Sydney: Parramatta light rail network unveiled*. http://www.transport.nsw.gov.au/newsroom/media-releases/making-it-happen-western-sydney-parramatta-light-rail-network-unveiled.

_____ (2016a). *Parramatta Light Rail Industry Briefing*. http://www.transport.nsw.gov.au/sites/default/files/b2b/projects/parramatta-light-rail-industry-briefing-march-2016.pdf.

_____ (2016b). *Sydney Metro City & South West: Final Business Case Summary*. http://www.sydneymetro.info/sites/default/files/Sydney%20Metro%20CSW%20Business%20Case%20Summary.pdf.

Treasury (2010a). *Australia's future tax system - Report to the Treasurer*. http://taxreview.treasury.gov.au/content/Content.aspx?doc=html/pubs_reports.htm.

_____ (2010b). *Australia to 2050: future challenges*. http://archive.treasury.gov.au/igr/igr2010/report/pdf/IGR_2010.pdf.

_____ (2015). *Commonwealth Budget Papers 2015-16*. The Treasury. http://www.budget.gov.au/2015-16/index.htm.

_____ (2017). *Tax Expenditures Statement 2016*. http://www.treasury.gov.au/~/media/Treasury/Publications%20and%20Media/Publications/2017/Tax%20Expenditures%20Statement%202016/Downloads/PDF/Tax%20Expenditure%20Statement%202016.ashx.

TriMet (2012). *Fact Sheet: Airport MAX Red Line*. https://trimet.org/pdfs/history/railfactsheetairport.pdf.

Turnbull, M. (2016). *Speech to the National Cities Summit*. Melbourne. https://www.pm.gov.au/media/2016-04-29/speech-national-cities-summit-melbourne-0.

Victorian DEDJTR (2016). *Melbourne Metro Business Case*. Victorian Department of Economic Development, Jobs, Transport and Resources. http://metrotunnel.vic.gov.au/__data/assets/pdf_file/0006/40677/MM-Business-Case-Feb-2016-WEB.pdf.

Victorian DELWP (2016). *Proposed Development Opportunity at Ormond Station*. Victorian Department of Environment, Land, Water and Planning. http://www.planning.vic.gov.au/__data/assets/pdf_file/0023/9437/Information-Sheet-Ormond-Railway-Station.PDF.

Victorian DPCD (2012). *Managing Melbourne: Review of Melbourne Metropolitan Strategic Planning*. Victorian Department of Planning and Community Development.

Victorian DTF (2016). *Victoria's credit rating*. Victorian Department of Treasury and Finance. http://www.dtf.vic.gov.au/Victorias-Economy/Economic-indicators-and-statistics/Victorias-credit-rating.

Waverley Historical Society (2016). *History of the Waverley Area*. http://home.vicnet.net.au/~whsvic/wavhistory.htm.

Weinstein et al. (1999). Weinstein, B. L. and Clower, T. L. *The initial economic impacts of the DART LRT system*.

Western Australian Treasury Corporation (2016). *Credit ratings*. http://www.watc.wa.gov.au/home/investors/institutional-investors/credit-ratings.html.

Williams, P. (1998). *Australian Very Fast Trains-A Chronology*. Background Paper 16 1997-1998. http://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/Publications_Archive/Background_Papers/bp9798/98bp16.

Xu, Y. (2015). *Under What Circumstances Will Land Value Capture Work to Finance Public Transit? Based on Case Studies of Hong Kong, Tokyo and New York City*. https://academiccommons.columbia.edu/catalog/ac:187325.

Yescombe, E. R. (2007). *Public Private Partnerships: Principles of Policy and Finance*. Oxford: Butterworth-Heinemaan.

Zhang et al. (2015). Zhang, M. and Liu, Y. *An exploratory analysis of Bus Rapid Transit on property values: A case study of Brisbane's South East Busway*. http://espace.library.uq.edu.au/view/UQ:379896.

Zhao et al. (2012). Zhao, Z. J., Vardhan, K. and Larson, K. "Joint development as a value capture strategy for public transit finance". *The Journal of Transport and Land Use* 5 (1), pp. 5–17. https://www.jtlu.org/index.php/jtlu/article/viewFile/142/208.