CHAPTER 28

FUNDING TRANSPORT INFRASTRUCTURE TO SUPPORT PERTH'S GROWTH – OPTIONS AND STRATEGIES

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INTRODUCTION

Planning for Perth is focussed on a projected population of 3.5 million. Reaching this city size and maintaining both efficiency and liveability will require a large investment in urban infrastructure, especially transport infrastructure.

Planning for this outcome is occurring at a time when Western Australia, like most jurisdictions, is having difficulty funding the new projects needed to support growth.[1] Public sector net debt is projected to grow from $22 billion at 30 June 2014 to $29.4 billion by 30 June 2018 (Government of Western Australia, 2014)[2]. The budget position is further complicated by the underlying volatility of state revenues, the declining share of GST revenue and the recent loss of the AAA credit rating. Projected general government operating surpluses are not large enough to fund the infrastructure program required to meet the desired growth trajectory. Given this budget position, a greater involvement from the private sector in funding infrastructure will be required and policies will be needed to facilitate this involvement and manage the associated risks.

Switching the infrastructure-funding emphasis to the private sector should be relatively straightforward. Essentially, it is a matter of defining projects in sufficient detail and then establishing clearly how the private investors will receive an adequate

rate of return on their investment. However, the Australian and overseas experience suggests that in practice, achieving the desired outcomes has proved challenging. Transport infrastructure is long lived and, over time, a complex mix of government and market decisions influence its performance. In this environment, seeing the future well enough to determine project returns is a major challenge for both the public and private sectors. Perhaps the best example here is the poor record of demand forecasting in Public Private Partnerships (PPPs).[3] Moreover, purely political decisions can also negatively affect long-run outcomes for projects. Here an experience in the UK is instructive. Following political pressure, the government refused to allow previously agreed road toll increases to proceed for some projects, effectively cutting returns to private investors and requiring a greater government funding commitment (Shaoul, Stafford & Stapleton, 2012).

PLANNING, APPRAISAL AND FUNDING

A coherent approach to financing requires a consistent and comprehensive infrastructure-planning framework, based on integrated land-use and transport planning. This creates the necessary base for long-term transport and related infrastructure investment decisions consistent with achieving growth targets efficiently. Much of financing is not separable from planning. Poor outcomes associated with the increased reliance on private funding of transport, and the use of PPPs in particular, is largely attributable to the lack of a coherent planning and regulatory framework (see Parsons Brinckerhoff & Balfour Beatty, 2012; Infrastructure Finance Working Group, 2012; Stanley, 2011).

The planning system needs to encompass consistent and transparent policy settings across spatial land-use planning (growth boundaries, residential location and density, infill patterns, port locations, airport locations, industrial and commercial land locations) and transport planning (road and rail corridors, high wide-load corridors, port development, target modal split).

Consistent policies on the pricing and regulation for major infrastructure and related services are required. The approach taken to these issues will determine the spatial structure on the economy and as a corollary the transport investments needed. For example, a city that has full marginal cost pricing of infrastructure combined with strategies to raise housing densities and encourage the use of public transport will look considerably different and have very different infrastructure funding needs to one that subsidises fringe urban infrastructure investment and promotes lower housing densities and greater use of private vehicles.[4]

Alongside an integrated land-use planning and transport system, a consistent approach to the pricing and regulation of externalities is required to allow effective project appraisal and the involvement of the private sector in funding. Major transport projects are almost invariably associated with a mix of positive and negative externalities. The policies in place to deal with these externalities have a direct bearing on funding and risk management.[5] When externalities are not fully internalised, such that they show up as revenues or costs to the private owner/operator, planners must have a specific set of policies in place to ensure optimal infrastructure investment. For example, Perth does not have general road-user charges and no specific road congestion pricing, meaning road users do not pay the full marginal cost of road use including congestion. In the absence of internalisation through the implementation of first-best prices, second-best pricing is needed. This might require that a subsidy be paid to the operator (private or public) of bus and train services to offset the fact that road users do not pay the full marginal cost for the road resources they consume nor the congestion costs they impose.[6]

In determining a funding approach for transport infrastructure, as the saying goes, 'there's no such thing as a free lunch'. An important part of the funding challenge is working out who will pay and how. From a public policy perspective, the key principle here is the beneficiary principle. That is, the beneficiary of a service should pay for the benefit received, without invoking any

equity argument. This principle needs to be embedded within the planning and funding framework.

An important consideration in financing and the application of the beneficiary principle is the nature of the infrastructure and its attributes. Major transport infrastructure provides services that are essentially private goods. The services can be sold in private markets. On this basis, there is a case for private involvement in funding and operation across a range of transport infrastructure for Perth including toll roads, bridges and tunnels, parking stations, seaports, ferry ports, airports, rail track, rail stations, rail rolling stock and buses.[7]

Transport investment is lumpy. Transport infrastructure is long lived. In many cases, the infrastructure provides essential services with limited or no competition and with high barriers to entry. In private hands, these assets are likely to have predictable and steady cash flows with a strong yield component and low volatility.[8] They are attractive investments and defined as core economic infrastructure within the investment marketplace.

Arguably the challenge is not the lack of private funding per se, but the design of an optimal planning and regulatory (pricing and capacity) framework that allows adequate returns to investors whilst ensuring that the desired economic and social outcomes are delivered for Perth. Whatever the underlying philosophy of planning and funding, like all cities, Perth will be building a strong 'appraisal culture', incorporating rigorous social cost benefit analysis of all projects. In this way, policy makers and planners need to ensure that private funding is directed to the suite of transport projects that will produce the most efficient economic and social outcomes for the city.[9]

FUNDING OPTIONS

Multiple funding options exist and the evidence suggests that no one funding option is a complete solution for infrastructure funding. Each has a potential role. The challenge is to understand

how each option fits into the broader taxation and financing policies of government and how each fares when assessed against the ability to support the underlying transport planning objectives of government including creating incentives for efficient behaviour by agents. Funding options differ in the way they relate to the beneficiary principle.

GENERAL TAXATION, INFRASTRUCTURE LEVIES AND BORROWING

Western Australia does not levy income tax or GST. Personal and corporate income tax and GST are all collected by the federal government. These revenues are partially allocated back to the states using various revenue sharing formulas along with tied grants and direct grants.

Tax instruments available in Western Australia are limited – primarily mining royalties, payroll tax, stamp duty and land tax. The heavy reliance on royalties is largely responsible for the volatility that exists in Western Australia's revenues. Royalty income was 6 per cent of total revenue in 2004–05 and is estimated to be 21.5 per cent in 2014–15 (Government of Western Australia, 2014, p. 87).[10]

Stamp duty and payroll tax are inefficient tax instruments. Stamp duty is a disincentive for buying and selling houses. It is effectively a disincentive to mobility. Payroll tax is a tax on labour and, as such, is a disincentive for jobs. Using these to fund higher infrastructure spending will lead to greater inefficiency. Land tax is a relatively efficient tax. At the state and local level, it is a preferred tax base for funding transport infrastructure (Chapman, Cornia, Facer & Walters, 2008). In Western Australia's case, it is the least damaging to efficiency of the three. The Economic Regulation Authority (2014) has recently assessed the relative efficiency of these taxes in Western Australia, suggesting that greater reliance on land tax would allow revenue to be raised more efficiently. An infrastructure levy in the form of land-based tax would offer

significant advantages for funding transport infrastructure for Perth. It is an efficient tax and because of its broad base and alignment to the distribution of transport benefits, it can be designed to approximate the beneficiary principle reasonably well.

Public sector borrowing can be through general bonds or infrastructure bonds. As with general tax revenues, general borrowing can be directed to any project and is not specifically connected to any specific transport planning objectives.

An important aspect of government debt funding is that the cost of infrastructure is spread over current and future generations of taxpayers. By spreading the repayments on loans over future years and making the repayments from current taxation revenues generated in these future years, the burden of repayment is spread over time. This process may approximate the delivery of the beneficial services to current and future taxpayers. This is more likely when the assets being funded provide widely distributed benefits. In this case, the cost of debt is being shared across those who will use the assets today and those who will use the assets into the future.

Although this is a better approximation of the 'beneficiary pays principle' than the straight use of general tax revenue to fund infrastructure, the match between those paying the tax and those receiving the benefits from the infrastructure is still only approximate.

Where borrowing is through a Government Trading Enterprise (GTE), servicing the debt needs to be through user charges or through a tax-funded subsidy to the GTE. Although in principle there is little difference between borrowing by general government and borrowing by GTEs, borrowing by GTEs causes the risks to be more directly connected to the management team responsible for planning, constructing and operating the infrastructure. This should engender greater project management discipline (Grimsey & Lewis, 2008).[11]

Notwithstanding these arguments, the previously discussed revenue and debt position of the Western Australian Government

means that, into the future, transport infrastructure funding from public sector borrowing will be restricted.[12]

ROAD AND VEHICLE PRICING

Pricing approaches include general road-user charges, heavy-freight vehicle charges, congestion pricing, cordon area tolls, parking levies, and vehicle- and individual-based licence fees. Currently in Perth only parking levies, like the central city parking levy, and vehicle and individual licence fees are used. However, while user charges are well established for the provision of public transport services, road-user charges are not established in Perth.[13] Arguably, they need to be part of the discussion for future transport. Unlike general taxation funding, these charges have the potential to raise revenue while at the same time generating pricing signals consistent with achieving the underlying transport-planning objectives.

Road pricing is especially relevant. There is growing recognition of the need to consider road pricing an integral part of the transport infrastructure planning and investment framework (Productivity Commission, 2014). Current funding arrangements for roads are arguably unsustainable (Infrastructure Partnerships Australia, 2013). Road pricing needs to be a key element in addressing the imbalance between road-related revenue and expenditure for two reasons: first, it is consistent with the crucial beneficiary pays principle; second, it will encourage a more efficient use of the road network.

For funding purposes, a distinction needs to be made between road-user charges as a general usage charge and congestion charges designed to deal with congestion externalities on a particular part of the network.

General road-user charges are applicable to uncongested and congested roads. To be consistent with the beneficiary pays principle they would be set equal to the long-run marginal cost of supply, including any marginal externality costs.[14] At this time, a broad road-user charging system is unlikely to be appropriate for

Perth. The system would require extensive investment in monitoring and collection systems and, given the cost and complexity of the system, significant net gains from implementation are unlikely because the share of the revenue that will be consumed by system-operating costs is typically very high (Deloitte Australia, 2012). Crucially in Perth, as in most jurisdictions, the evidence is that road-user charges lack broad community and political support.

In the first instance, congestion pricing is a more realistic option. The Western Australian Economic Regulation Authority has argued for congestion charges in Western Australia.[15] A congestion charge would focus on major congestion areas and corridors where congestion is already high.[16] Implementation can be based on sophisticated electronic-pricing systems through to simple zonal-based schemes in which a fee must be paid to drive into a congested area (typically the central city). Cordon tolls are a simplified form of congestion charge. Road pricing could be initiated in Perth with a simple cordon charge and, if required, expanded to other congested areas and to road users generally over time. Arguably, given what we know about congestion in Perth and the planned growth, the important thing is to build a road pricing strategy into the transport-planning system so that any behavioural changes likely to be caused by the implementation of pricing in the future are incorporated into capacity expansion decisions for road and public transport.[17]

VALUE CAPTURE

Land taxes are an efficient way to raise funds for infrastructure. Value capture is a form of property tax based on the well-documented relationship between transport infrastructure provision and property values. Although light rail has been a focus for the debate on using value capture to fund transport infrastructure, value capture could potentially be applied to a range of infrastructure provision in Perth (Debrezion, Pels & Rietveld, 2004; Diaz, 1999; Pan, 2013).

Notwithstanding the logic of value capture, it is important to recognise that a number of property taxes and charges are already levied on property values in Perth, with the outcome that any increase in property values consequent on transport investments will automatically generate increases in property-related revenue for the relevant jurisdictions within the existing system.

This rise in property revenue when tax rates and base values are left unchanged is a natural outcome of the change in property values caused by the infrastructure investment;[18] it is part of general tax revenue attributable to the relevant authority, for example local government. A simple form of value capture would be hypothecating this revenue increase to the particular project.

Hypothecation can be based on existing tax rates or the application of a specific differential rate to areas most benefitting from the development. Tax increment financing (TIF) is a form of value capture based around the specific rate concept. A TIF instrument is specifically established to fund particular transport infrastructure projects that have positive effects on surrounding property values. As such, a TIF must relate to a well-defined project and geographic area. Implementation of a TIF model in Perth for transport projects would require an estimate of the base case increase in property-based revenue (land tax or rate revenue) that would occur in the absence of the project. Projected property-based tax revenues above this base case are then hypothecated to the project based on the existing or a differential tax rate. Hypothecated funds will normally be managed by the authority responsible for developing the infrastructure.[19]

It should be noted that the ultimate impact on property values is dependent on the associated changes in land-use planning for the surrounding areas. For example, along a light rail route, planning changes can facilitate higher residential, commercial and retail densities with consequential effects on property prices and tax revenues from value capture. On this basis, tax collections from value capture are partly endogenous and the potential for

value capture to fund all or part of a project should be part of the project planning for major transport infrastructure investments.

There are a number of approaches for implementing value capture. No one model of value capture will work in all jurisdictions. The specific form of the implementation needs to take account of the land-use and ownership patterns around the proposed development and the nature of the existing land tax system (McIntosh, Newman, Trubka & Kenworthy, 2017). Value capture can be consistent with private development and operation of transport infrastructure. Where this occurs, value capture receipts may be generated through increased ad valorem land taxes and, along with other sources of revenue, factored into the contractual arrangements under which the private sector builds and operates the infrastructure. In this sense, value capture can be an integral part of PPP arrangements.[20] The potential to use value capture in Perth for rail infrastructure is discussed in more detail in chapter 8.

Arguably, the application of a value capture system in Perth is preferable to reliance on borrowings or general tax revenue. In a competitive market, the increase in property prices reflects the present value of the future stream of infrastructure services provided. Because the expected benefits are capitalised into current property prices, value capture levies based on increased property services and prices are in principle an equitable way to fund infrastructure. They broadly satisfy the beneficiary pays principle and are akin to user charges.[21]

DEVELOPER CONTRIBUTIONS AND IMPACT FEES

Developer contributions are a form of land-use exaction levied on real estate developers either as cash or in-kind payments. In-kind provision of infrastructure arises when a developer directly provides incremental infrastructure. This could include providing streets, water mains, sewers, parks, school and preschool buildings. Cash payments involve the developer funding or prefunding

the infrastructure investment by making a direct payment to the provider.

In Western Australia, developer contributions are specifically defined under the State Planning Policy 3.6 (Government of Western Australia, 2009) and are most commonly applied to residential developments. The developer contribution is levied for infrastructure that is inside an urban estate or required to connect the estate to the network. Ring-fenced to cover infrastructure defined in this way, developer contributions ensure that new residents pay for the cost of incremental infrastructure. This is because, in a competitive market, the future stream of benefits from the availability of infrastructure services will be capitalised into the estate property values. To the extent that the developer contributions are reflected in land prices, these charges are paid for by the consumers and are broadly consistent with the beneficiary principle.

However, the application of developer contributions to fund infrastructure that affects the urban area beyond the individual estate(s) is problematic. For infrastructure such as main roads or rail line extensions, allocating the direct benefits back to individual developers/consumers is complex. For these assets, the value capture approach to funding is preferable as it directly links the project to all properties (beneficiaries) that are affected by the project.

An extension of the developer contribution charge is the impact fee. Impact fees are used widely in the United States to fund a variety of infrastructure. In the USA they can be applied to any incremental infrastructure expansion required in a city consequent upon a particular urban development proceeding. As such, their application is not restricted to infrastructure directly connected to the development. For example, an impact fee could be levied by a city government for expanded railway station parking, road capacity upgrades or for expanding local library capacity contingent upon the scale and location of any residential or commercial development. Impact fees were conceived as an externality

charge; the idea being that the charge would internalise the incremental cost that the development imposes on residents and service providers. Impact fees are not used in Western Australia. However, the combination of planning decisions and developer decisions regarding the location scale and density of commercial and residential developments has potentially significant impacts on the demand for infrastructure services. The use of impact fees is a potential source of funds that would also encourage efficient development because the charges signal to developers the marginal infrastructure costs of alterative development configurations and locations.

PRIVATE FUNDING

Private funding will have to be a significant element in transport infrastructure planning for the growth of Perth. Private funding is almost infinitely flexible. It can be through private debt, private equity or a mix of the two. It can be for a whole project, as in a privately owned toll road, or it can be a partial participation. It can fund construction, operation or both. Private funding can involve private sector ownership with regulation or private sector operation under agreement with government.

Depending on the particular owner and funding arrangements, ongoing service costs can be funded by a mix of user charges, general government contributions (mainly taxation), shadow tolls, subsidies (including community service payments) and availability payments.[22]

Overseas, especially in the UK, PPPs have emerged as the dominant format for the involvement of the private sector in transport infrastructure funding (Blanc-Brude, Goldsmith & Välilä, 2007). Australia has not yet embraced PPPs to the same degree (Chong & Poole, 2013). Given the state budget constraints and the significant investment required in transport infrastructure to make Perth efficient at 3.5 million people, PPPs in Perth will need to be embraced more centrally as part of the funding strategy. At

Availability risk	The risk that the volume of the service provided is less than that required under a contract.
Construction risk	The risk that the construction of physical assets is not completed on time, to budget and to specification.
Demand risk	The risk that demand for a service does not match the planned level, projected or assumed. As the demand for a service may be partially controllable by the public body concerned, the risk to the public sector may be less than that perceived by the private sector.
Design risk	The risk that design cannot deliver the services at the required performance or quality standards.
Economic risk	Project outcomes are sensitive to economic influences. For example, actual inflation differs from assumed inflation rates.
Environment risk	Where the nature of the project has a major impact on its adjacent area and there is a strong likelihood of objection from the public.
Funding risk	Where project delays or changes in scope occur because of the availability of funding.
Legislative risk	The risk that changes in legislation increase costs. This can be subdivided into general risks, such as changes in corporate tax rates, and specific ones that may affect a particular project.
Maintenance risk	The risk that the costs of keeping the assets in good condition vary from budget.
Operational risk	The risk that operating costs vary from budget, that performance standards slip or that service cannot be provided.
Planning risk	The risk that the implementation of a project fails to adhere to the terms of planning permission or that detailed planning cannot be obtained or, if obtained, can only be implemented at costs greater than in the original budget.
Policy risk	The risk of changes of policy direction not involving legislation.
Procurement risk	Where a contractor is engaged, risk can arise from the contract between the two parties, the capabilities of the contractor and when a dispute occurs.
Reputational risk	The risk that there will be an undermining of customer/media perception of the organisation's ability to fulfil its business requirements, e.g. adverse publicity concerning an operational problem.
Residual Value risk	The risk relating to the uncertainty of the value of physical assets at the end of the contract.
Technology risk	The risk that changes in technology result in services being provided using non-optimal technology.

Table 1: Project Risks (Summarised from H.M. Treasury, 2014).

their base, PPPs are relatively straightforward. Required transport projects are defined as part of the integrated planning framework and fully appraised through cost benefit analysis. Government then invites the private sector to participate in funding, owning

and operating the infrastructure project. The mix of private-sector funding, ownership and operating control can vary from project to project.

However, experience suggests the reality has been considerably different and that implementation of PPPs needs to be approached carefully. If PPPs are to be successfully incorporated into future transport infrastructure funding for Perth, full account needs to be taken of the limited experience to date in Western Australia and of the extensive experience elsewhere. Reviews of PPP performance make clear that the critical factor for successful implementation is the management of risk sharing between government and private sector. Lack of clarity about risk sharing combined with poorly specified performance contracts are most often cited as the reasons why PPPs underperform or fail (Perkins, 2013). Several risks need to be managed.

The UK Treasury has set out the scope of the project risks in PPPs. Table 1 summarises these (H.M. Treasury, 2014).

The risks noted in Table 1 are well recognised, but are not equal. Demand risk and construction cost risk pose the greatest concern for financial investors (Sharma, 2013). They also pose the significant risk that residual shortfalls in financial performance will ultimately become a liability for government, with poor performing assets handed back or government required to fund availability payments to secure ongoing delivery of services.

These risks cannot be viewed in isolation. There are potential interactions between these individual risks that need to be recognised. Growing cities have dynamic planning environments. Land-use patterns can change markedly in a short time. In this environment, demand risk, planning risk, policy risk and legislative risk interact with each other and with global financial arrangements for PPPs, producing collective risks that are not fully understood when each risk is viewed in isolation.

Transport networks in urban areas will always be subject to these collective risks. Growth and the evolution of economic arrangements and technology mean that the best way to organise

transport networks changes over time. Urban growth is managed with a complex mix of transport, land-use planning and pricing that changes the allocation of resources across activities and locations in the urban area over time. Yet as Torrance (2008) has argued, the trend to private investment in network infrastructure has meant that urban infrastructure is also becoming a networked financial product. For a small to moderate size city like Perth, a single transport project (e.g. a light rail line) may be significant relative to the size of the city budget, but constitutes only a small part of the private investor's global portfolio.

Transport projects need to deliver the required outcomes for the investor and the urban community and must deliver over an extended period. Each project needs to deliver a rate of return to the private investor consistent with the rate the investor can earn on other parts of the global infrastructure portfolio and in alternative markets taking account of individual project risks. The project also needs to deliver planned outcomes to the community. It has to operate effectively as part of the transport network in a growing city where the mix of economic activities, the residential and transport preferences of individuals and available transport technologies will interact and change continuously.

This creates a potential socio-political risk. The performance required from the transport network will be influenced by future transport and land-use planning. This will affect the role that any individual project has within the network. In turn, this will affect future demand for the project. Yet, the future required changes in planning and transport as the city grows are uncertain. From the government's perspective, committing to a planning regime consistent with the original project forecasts will potentially reduce the flexibility to adjust efficiently as the urban area grows. There is a risk that ensuring the return to the private investor may come at a cost to network and land-use efficiency. From the investor's perspective, there is a risk that changes to the planning system will undermine the rate of return and make the project suboptimal as part of a global portfolio.

This suggests that a critical issue in embracing the PPPs to fund future Perth transport infrastructure is the need to clarify the government role in planning and adjusting land-use and how future impacts on PPP-funded projects will be managed. Experience elsewhere suggests that an important aspect is whether long-term leases (e.g. ninety-nine-year leases), without a formal regulatory structure in place, are workable in situations where local urban growth conditions can change short term.[23]

DEMAND RISK

Of all the risks identified, demand risk has received most attention in the literature. Forecasts of the patronage over the life of the project are critical in the transport planning and funding process. Errors in patronage forecasts can jeopardise the underlying financial viability of a project. The long-lived nature of large transport projects compounds this risk.

Despite their importance, the evidence shows that demand forecasts are far from perfect. Toll road PPPs have been extensively reviewed for patronage forecast accuracy. A 2005 survey evaluating this performance for 104 roads, bridges and tunnels in Europe, the Americas, Asia and Australia, found significant overestimates of likely traffic volumes (Bain & Polakovic, 2005). On average, toll road traffic forecasts were too high by 20 to 30 per cent for traffic volumes in year one. Variability was large – a low of 15 per cent of forecast traffic to a high of 50 per cent above the forecast. A recent review of forecasts for Australian toll roads found average traffic volumes in the first year of operation to be only 55 per cent of forecast levels (Li & Hensher, 2010).

While evidence suggests a 20 per cent optimism bias in toll road performance, the literature suggests that patronage forecasting is generally poor (Bain, 2009). A 2005 review of 210 projects found that statistical forecasts of transport demand are poor for both rail and road projects (Flyvbjerg, Skamris Holm & Buhl, 2005). Moreover, when looked at over the thirty-year time

frame covered by the projects in the study, the results suggest that forecasts have not become more accurate over time.

This suggests that to successfully embrace PPPs and manage demand risk for Perth, transport planners will need to refine forecasting methods as part of the planning process and develop governance structures that ensure agreed forecasting methodologies are implemented properly and transparently.[24]

As with other risks, demand risk needs to be allocated in the way that maximises the long-run net benefits of the project. To do this, the risk needs to be allocated to the sector that is best placed to manage it. If there are network risks for the project that government can influence, it may be appropriate that government bears some, or even all, of the demand risk. At one extreme, this might involve the government developing and managing the project. At the other, it may only influence the design of the funding arrangements by which the private sector becomes involved. For example, compared to using direct tolls, availability payments shift demand risk to the government/taxpayer.[25]

CONCLUSION

To secure an efficient city at 3.5 million, Perth requires major investment in transport infrastructure. Historically, large projects have been funded from the state's major revenue sources: state tax revenue, GST allocations and Commonwealth grants combined with user charges. The current and projected state government budget position means that the state cannot rely on these traditional sources to fund major infrastructure projects going forward. Greater reliance will have to be given to private-sector funding, most likely in the form of PPPs, but also through full private ownership and operation where a project supplies a private market good and can be financed totally or in large part from user charges with appropriate price regulation.

As an integral part of the project funding process, the state needs to embrace new pricing and taxing arrangements.

In particular, road user charges (including congestion charges) and value capture need to be integrated into the planning and funding process. These strategies are consistent with the beneficiary principle and simultaneously influence both the efficiency of existing infrastructure use and the quantum of private sector funding required.

Critical for success is the ability to manage finance risks, and allocate risk appropriately. Risk needs to be clearly articulated ex ante and central to this is a commitment to high-quality, long-term, integrated transport and land-use planning so that the parameters of projects can be assessed. This reduces the risk that unforeseen planning changes undermine project viability. It will also allow a better specification of the projects that are most suitable to private sector involvement.

Demand forecasting has proven to be a significantly weak link in developing major transport projects with private sector involvement using PPPs. A case can be made that state planning agencies should be made responsible for developing the forecasting methodology and the forecasts to be used in project assessments. Risks around this key parameter, which have undermined many PPP projects globally, could then be better managed.

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NOTES

1 Not all infrastructure projects have simple connections to population and economic growth. New and expanded ports and road and rail freight capacity directly facilitate expansion of commodity exports. Investment in urban road and rail capacity facilitates urban growth and is required to secure growth in residential and commercial activity in an efficient way. On the other hand, there may be projects that are less obviously connected to economic and population growth, at least in the short run. Cultural precincts, stadiums and preservation of historic buildings are examples of projects that are often presented as community building. They are part of a growing city developing a greater degree of sophistication and a more global orientation.

2 This is an increase from 8.4 per cent of GSP in 2013–14 to 9.2 per cent in 2017–18.

3 Reviews of forecasting errors can be found in Bain, 2009; Bain & Polakovic, 2005; and

Flyvbjerg Skamris, Holm & Buhl. 2005.

4 This is arguably the current position in Perth. Recent railway investments combined with the push for transit-oriented developments and infill have been focussed on developing a more compact city with higher development densities. This broad philosophy is embedded in Directions 2031. Yet, as recent debate indicates, Perth still has a way to go in pursuit of these particular outcomes. Employment is still heavily focussed on inner and middle metropolitan areas, journey to work times are increasing and both public and private transport appear to be at or near capacity for much of the time. A simple view is that increased investment in transport capacity and/or the implementation of road pricing is required to alleviate these problems. These are undoubtedly required as an integral part of the long-term solution. It can be argued the failure of planning to achieve stated employment decentralisation objectives within the metropolitan area or to achieve targeted development densities has been critical in producing the current outcomes. Private sector financing may be critical to solving the capacity investment problem but it won't solve the planning problem.

5 In the presence of unregulated or unpriced negative externalities such as noise pollution, water pollution, severance and loss of environmental aesthetic values, private investors may be led to finance socially undesirable investment projects or, at the very least, to overinvest compared to the socially optimal provision of the infrastructure. On the other hand, with positive externalities, for which a private investor receives no return, sub optimal investment will result.

6 The public transport subsidy is a form of second-best pricing designed to make the relative transport prices to users reflect the underlying relative marginal social costs. A subsidy may also be justified where a transport investment is associated with positive externalities in the form of network efficiencies.

7 Taken one step further, the private good nature of some of these series makes them ideal candidates for private ownership.

8 The degree of competition in some cases will reflect land-use and transport planning. For example, a toll road may have public roads as substitutes. How the government manages investment and traffic on the public network will affect the attractiveness, traffic flows revenues and profit potentials for the private toll road. This in turn will influence the second-best price to set on the toll road and the extent of any government subsidy required.

9 When projects are redefined as part of the development and financing process, there will always be a question about whether it is being done to improve the net social outcome or to achieve specific financial outcomes. This is unavoidable. However, if the strategic planning and evaluation process is rigorous, it establishes the relevant benchmarks for assessing the merits of such project changes. This is a primary reason for adhering to a stringent planning and evaluation process.

10 This volatility has had an increasing impact on state revenue because the share of state-based tax revenue in total revenue has increased significantly. This is attributable to the decline in WA's share of GST revenue, although it should be noted that combined GST and Commonwealth grant income has declined less than that of GST income alone.

11 This argument can also be applied to regulated private natural monopolies and would be one of the benefits of privatising government transport assets into a fully developed regulatory regime. Although not discussed here, in the UK recent work has suggested bundling transport assets such as roads into private structures that could then be sold. These would then form part of the Regulatory Asset Base (RAB) and would be regulated in the same way as any other natural monopoly. (On this topic see Cook, 2011, and Helm & Tindall, 2009).

12 GTE borrowing does not quarantine the effect of the borrowing from general government.

In most jurisdictions, the government is ultimately responsible for meeting any financial obligations of its GTE.

13 The Perth freight link and the associated proposal to charge heavy vehicles using it is a first step in this direction.

14 It is fundamental, therefore, that road-user charges should be forward looking. They should be based on projected expenditure, be structured to reflect the actual road usage and cost and should vary across different vehicle types.

15 It should not be thought that road-user charges or congestion charges are the only potential reform element. Glaister and Smith (2009) outline a raft of potential reforms in ownership and governance that could work alongside road pricing to improve efficiency and funding including privatisation and addition of a regulatory asset base framework for setting user charges.

16 The National Transport Commission and the Bureau of Infrastructure, Transport and Regional Economics (BITRE) have noted that future population growth is expected to have enormous flow-on implications for transport in Australia and that the avoidable cost of congestion to the Australian economy is predicted to increase from around $9 billion in 2005 to around $37 billion by 2030 (BITRE, 2015, p. 1).

17 The revenue raised from a congestion charge does not have to be used to fund road expansions in the congested area or indeed any other specific transport infrastructure. The charge is designed primarily to influence behaviour by signalling to drivers the full marginal social cost of their actions. In doing this, congestion charges will influence the pattern of net benefits from proposed transport projects because they will change the pattern of road use and congestion. General congestion charges and cordon tolls are designed to influence behaviour. In the short run, motorists can seek an alternative route, car pool or switch to public transport. In the long run, the charges create incentives to select alternative destinations and economic activities that do not need to be in the congested area will have incentive to relocate. In this way, a congestion charge is integral to encouraging greater employment self-sufficiency in the Perth planning corridors.

18 For example, if land rental values increase then the local government area will experience an increase in rate revenue for a given tax rate.

19 For large scale and complex projects, it has been suggested that a special purpose TIF authority may need to be established (Pricewaterhouse Coopers, 2008).

20 Where ownership patterns allow, the developer of the transport infrastructure may also be a participant in the associated land developments, with the returns from the land development factored into the overall funding arrangements from the transport infrastructure.

21 The interpretation is not without caveats. User pays is much clearer cut, for example, when the beneficiary is the user of a bus or car trip and they pay a trip-based charge. The property-based charge applies to the property. It is problematic as to whether we can identify the proportion of the project benefits that can be attributed to a particular property over the assessment period when this assessment has to be made even before the infrastructure is constructed.

22 Private funding may entail the government guaranteeing the repayments. This may be necessary, for example, to assist the private sector to raise the required funds and to ensure that the infrastructure project is not put at risk by future private investor difficulties. However, if the government guarantee is unconditional then the lenders to the private developer are effectively lending to the government and it could be argued that there is really no difference between government and private funding. This goes to the issue of risk sharing, which is disused in detail below.

23 Stanley (2011) has argued that to secure the investment funds required for transport infrastructure, especially from pension funds, it requires a stable framework for planning and management. This includes having a stable regulatory system covering price regulation and service regulation and urban planning regulation.

24 Variable concession length has been suggested as one way to manage demand risk and the potential over estimation of demand. (See Engel, Fischer & Galetovic, 2013.)

25 Demand risk is not entirely exogenous. Government can influence demand factors. Specific to the transport system are the nature of the feeder routes and the connections to the rest of the network; the degree of competition with alternative routes; the existence and management of intermodal competition and parking and congestion charges. Factors connected to the planning system include development of housing, commercial and industrial property proximate to the infrastructure and the operation of broader urban policies such as city growth boundaries.

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