Synergies
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An Economic Approach to Heavy Vehicle Road Pricing Reform

Report prepared for Aurizon, ARTC and Asciano

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Key Points

The Transport and Infrastructure Council's current Heavy Vehicle Road Reform initiative is designed to create a market mechanism "that links heavy vehicle user needs with the level of services they receive, the charges they pay and the investment of those charges back into heavy vehicle road services." The purpose of this paper is to consider the design features and approach for an economic pricing framework for land freight transport infrastructure that will deliver this objective of the Council.

Road and rail freight services are directly substitutable in the inter-city general and container freight market. That is, for certain types of freight, road and rail are in direct competition. However, they are also currently subject to very different pricing frameworks and regulatory regimes.

Rail access charges are determined on a transparent and cost-reflective basis under regulatory frameworks developed in accordance with economic principles in the *Competition Principles Agreement* (CPA) agreed between the Commonwealth and States. However, the current road pricing regime for heavy vehicles does not provide a clear and direct relationship with the costs of servicing heavy vehicles. As a result, the regime does not provide:

- clear and cost-reflective price signals, which are necessary to promote the efficient allocation of resources and enable improvements in productivity; and
- effective competition between road and rail, with the result that it is not producing the economic efficiency benefits that are typically associated with effective competition.

Maximising efficiency benefits from road freight charging and investment reform would require the design and implementation of a pricing framework that encourages more efficient decisions as to what mode of transport (road or rail) is used by heavy transport haulage suppliers and end customers, as well as when and where to further invest in the transport network infrastructure.

This would require the application of a holistic and well-coordinated approach to pricing road and rail freight services, based on consistent pricing objectives and principles. Those principles should be the same as the principles applied to other regulated infrastructure sectors in Australia, including rail, as set out in the CPA. This includes an overarching objects clause where prices are set to encourage efficient utilisation of, and investment in, the relevant network infrastructure.

This will achieve competitive neutrality, which is important for promoting effective competition, as well as improving productivity and innovation.

If the Council's objectives are to be achieved, there are two main long term pricing frameworks that can be applied to heavy vehicle access to road network infrastructure: Long Run Marginal Cost (LRMC) and the Building Blocks approach.

The Building Blocks approach is the most common approach applied in implementing economic reforms in infrastructure industries in Australia. This approach sets a maximum revenue allowance that the infrastructure owner can recover, including a return on and of capital, based on a forward-looking assessment of efficient costs. It also explicitly recognises sunk costs by including existing assets in the Regulated Asset Base (RAB). The key reason for this is that appropriate recognition of these costs is considered essential in preserving investment incentives for infrastructure providers through ensuring an appropriate return on (and of) capital invested.

The application of a single, consistent pricing framework for land transport infrastructure would optimise achievement of the Council's objectives and reduce the scope for differences in the regulatory treatment between road and rail. This would assist with minimising competitive distortions and maximising efficiencies. An alternative, but 'second best' solution, would involve separate pricing frameworks based on a consistent set of principles that ensured that both road and rail users faced cost reflective prices, preferably administered under a single regulatory arrangement.

A critical implementation issue will be the appropriate institutional arrangements. The institutional arrangements should ensure:

- a competitively neutral approach to the application of the pricing objectives and principles; and
- administration under a single regulatory arrangement.

In terms of the next steps, the priorities should be agreement in the following areas designed to maximise the efficient allocation of resources, productivity improvements and innovation and meet the Council's goal of reporting to COAG on a transition to independent heavy vehicle price regulation by 2017-18:

- the pricing objectives and principles for both heavy vehicles using key freight routes and intermodal rail freight using the interstate network;
- the appropriate pricing mechanism;
- the appropriate institutional arrangements.

Overview

In response to the Transport and Infrastructure Council's (the Council's) current Heavy Vehicle Road Reform initiative, Synergies Economic Consulting has been requested to prepare a response on behalf of Aurizon, Australian Rail Track Corporation (ARTC) and Asciano on the application of an economic pricing framework to land freight transport infrastructure. We have been requested to respond to some specific questions relating to the objectives and design of such a framework, which will need to be further explored in more detail once the overarching objectives and principles have been agreed. We have been requested to prepare the paper based on the road freight charging structure and principles provided in Attachment A.

Road and rail freight services are directly substitutable in the inter-city general and container freight market. This means that for certain types of freight, road and rail are in direct competition. However, they are also currently subject to very different pricing frameworks and regulatory regimes. Road services provided by public sector entities are in direct competition with the corporatised rail service provider, ARTC, which is required to operate its business on commercially sound principles.

Rail access charges are determined on a transparent and cost-reflective basis, under Commonwealth and State-based regulatory frameworks that have been developed in accordance with economic principles contained in the *Competition Principles Agreement* (CPA). The current PAYGO model used for heavy vehicle charging estimates the total cost of road use and allocates a cost share to heavy vehicles. Under this framework, the National Transport Commission (NTC) makes non-binding recommendations on the charges to be collected from heavy vehicle operators in two parts:

- a road user charge based on the effective rate of diesel fuel excise paid by heavy vehicle operators;
- an annual registration charge dependent on the configuration of the vehicle, which is set and collected by State and Territory Governments. The intention is to set the registration charge to recover the balance of costs attributable to each class of vehicle.

A key issue with the current road pricing regime is whether heavy vehicles operating on the key freight routes are bearing a less than proportionate share of the costs they impose on the network (including where there are capacity constraints), resulting in cross

subsidies between different road user classes[1] and across transport modes (i.e. road and rail).

This reflects the fact that under the current PAYGO approach prices bear no clear and direct relationship with the costs of servicing particular road users (in this case heavy vehicles). The two main problems that arise under this approach are that:

- current road prices tend to distort choices between road and rail in the carriage of freight. Such distortions will not result in efficient outcomes for the market or the wider community as resources are not being allocated to their most highly valued use; and
- prices do not provide relevant information or signals to promote the efficient allocation of resources, inform efficient investment and enable improvements in productivity.

We understand that consideration is being given by the National Transport Commission (NTC) to a forward looking PAYGO arrangement (or an 'enhanced PAYGO' arrangement[2]). While the full details of this proposed model are yet to be released by the NTC, it is not evident that it will address the fundament flaws in the current pricing arrangements.

Without clear and cost-reflective price signals in road transport, modal choices can be distorted. This would mean that while competition is occurring between road and rail, it is not producing the economic efficiency benefits that are typically associated with effective competition. Effective competition would maximise the benefits that can accrue to consumers via reductions in costs, improvements in service quality and, where capacity constraints emerge, investment that occurs at the right time, in the right part of the network and in the right sequence.

While there is some uncertainty as to whether all heavy vehicles have borne their proportionate share of costs historically, or whether the costs of past investments have been fully recovered, the issue now being addressed in response to the Council's reform objectives is how to design and implement an efficient, cost reflective, forward-looking pricing framework for the future, where cost-reflective prices provide appropriate signals to influence efficient network utilisation and investment decisions.

This will require the design and implementation of a pricing framework that encourages more efficient decisions as to what mode of transport (road or rail) is used by heavy

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1 That is, within heavy vehicle classes, between heavy vehicle classes and between heavy and light vehicles.

2 It is understood that this was indicated by the NTC in a presentation to stakeholders made on the 29th of March 2016.

transport haulage suppliers and end customers, as well as when and where to further invest in the transport network infrastructure. This approach will produce public policy benefits by achieving the optimal allocation of scarce resources and help maximise economic efficiency, as well as ensuring the most efficient use of taxpayers' funds.

The solution to this problem is to apply a holistic and well-coordinated approach to price road and rail freight services, based on consistent pricing objectives and principles. Those principles should be the same as the principles applied to other regulated infrastructure sectors in Australia, including rail, as set out in the CPA. This would include an overarching objects clause where prices are set to encourage efficient utilisation of, and investment in, the relevant network infrastructure. This would maximise efficiency benefits for the community and achieve competitive neutrality. Competitive neutrality is important because it is only through the promotion of effective competition that optimal outcomes are achieved for consumers, which is critical to improving productivity and innovation which are central to the country's future economic prosperity.

There are two main long term pricing frameworks that can be applied to pricing heavy vehicle access to road network infrastructure to meet the Council's economic objectives: Long Run Marginal Cost (LRMC) and the Building Blocks approach. The two are not necessarily mutually exclusive.

While LRMC tends to be seen as the theoretical benchmark or ideal, it is very difficult to correctly implement in its 'pure' form. As a result, the Building Blocks approach is the most common approach that has been applied in implementing economic reforms in infrastructure industries in Australia, which is still intended to be based on a 'forward looking' assessment of efficient costs.

This approach includes explicit recognition of sunk costs, which has been an inherent feature of all building block methodologies implemented to date. The key reason for this is that appropriate recognition of these costs is considered essential in preserving investment incentives for infrastructure providers through ensuring an appropriate return on (and of) capital invested. For public sector infrastructure investments, this will help ensure a rigorous approach to investment expenditure and an appropriate return on taxpayers' funds, which is essential given the ongoing pressure on Government budgets.

The application of a single, consistent pricing framework for land transport infrastructure would optimise the achievement of the Council's objectives and reduce the scope for differences in the regulatory treatment between road and rail (other than where necessary due to differences between each mode). This would assist in minimising competitive distortions.

However, if a single and consistent approach is not considered feasible, at least initially, separate pricing frameworks could still be maintained if they were each designed on a consistent set of principles, with a view to achieving efficient modal choice – as well as efficient investment in each mode - by ensuring that both road and rail freight users faced cost reflective prices. This would preferably be administered under a single regulatory arrangement. However this would be considered a 'second best' solution.

One of the most important implementation issues will be putting the appropriate institutional arrangements in place. The institutional arrangements should ensure that there is a competitively neutral approach to the application of the pricing objectives and principles, which should be administrated under a single regulator or an effectively coordinated set of economic regulatory arrangements. Options for a single regulator for access pricing of inter-city general and container freight on key freight routes would include the Australian Competition and Consumer Commission (ACCC) (as it currently determines access prices for ARTC's inter-state network), the separate access pricing regulator recommended by the Harper Inquiry or a national freight transport regulator (potentially sitting under an overarching utilities regulator).

Having regard to the timeline for the Council's requirement to report to COAG on a transition to independent heavy vehicle price regulation by 2017-18[3], the following priority "next steps" are recommended:

- Agreement of the pricing objectives and principles for both heavy vehicles using key freight routes and intermodal rail freight using the interstate network. The aim should be to enable the delivery of a framework that provides for competitively neutral pricing within the inter-city general and container freight market in order to maximise the efficient allocation of resources, productivity, innovation and overall community welfare.
- Putting in place a process, involving consultation with freight transport industry representatives, to:
  - consider in detail appropriate pricing options consistent with these agreed pricing objectives and principles; and
  - develop a pricing framework that would best achieve these objectives and principles for both road and rail freight competing on the key road freight routes and the interstate rail freight network respectively.
- Determination of the appropriate land freight access pricing infrastructure arrangements, with the agreed economic regulator having appropriate oversight

[3] Australian Government Response to the Competition Policy Review, November 2015, p. 5.

responsibilities. These arrangements should be confirmed at an early stage to ensure the development of the detailed pricing framework remains consistent with the agreed pricing objectives and principles.

1 Introduction

Synergies Economic Consulting has been requested to prepare a response on behalf of Aurizon, ARTC and Asciano on the application of an economic pricing framework to land freight transport. We have been asked to address the following questions:

1) Applying an economic framework to heavy vehicle road pricing and investment requires a clear definition of the relevant market. How should the scope of the market be defined?

2) Noting the issues that have already been articulated by the Transport and Infrastructure Council, including the importance of taking a holistic approach to land transport reform, what is/are the economic problem/s that the current reform agenda needs to address?

3) The Transport and Infrastructure Council has described roads as "the last unpriced utility", drawing parallels with the microeconomic reforms that have been implemented in electricity and water:

    a) using the Competition Principles Agreement agreed between the Commonwealth and the States as a starting point, what should be:

        i. the overarching economic objective/s of the pricing framework

        ii. the relevant pricing principles governing the design and implementation of the pricing framework?

    b) how will the objective/s and principles set out in (a) directly support the objectives of the Transport and Infrastructure Council?

    c) are there any specific objectives that the pricing framework needs to take into account?

    d) revenue neutrality has been previously articulated as an objective (although more in the context of overall road pricing (e.g. the Harper report), rather than road freight pricing). Should this influence the design of the pricing framework:

        i. if so, how?

        ii. if not, does it remain relevant and if so, where could it be applied?

4) At a conceptual level, what options are available to price land freight services in the relevant market (it should be noted that at this stage, this assessment is only required at a high level):

    a) what are the feasible economic pricing models that could be applied (noting that the two key models that are generally considered appropriate for efficient utility pricing are Long Run Marginal Cost and the Building Blocks approach)?

b) how do the models need to be applied and what are the potential consequences if they are not applied correctly?

c) what are the key challenges that might arise in implementing each model and how can they be overcome?

d) how would each model perform in achieving the objective/s and pricing principles?

5) With regard to the land freight transport sector/market as a whole, does achieving the objectives and pricing principles require that the different modes within the relevant market need to be subject to the same infrastructure pricing framework? Recognising that there are some significant differences between modes, could these differences be effectively addressed for each mode in the application of the same pricing framework so as to ensure that the differences do not compromise the objective/s and pricing principles?

6) What are the key issues that will need to be addressed during the implementation of the pricing framework? For example, this might include price pathing, institutional arrangements, etc.

7) What are the next steps?

We have been requested to prepare the paper based on the road freight charging structure and principles provided in Attachment A.

Our response to these questions is set out below.

2 Response to questions

2.1 Market definition

The concept of a market is defined by the *Competition and Consumer Act 2010* (s. 4E) as:

> ...'market' means a market in Australia and, when used in relation to any goods or services, includes a market for those goods or services and other goods or services that are substitutable for, or otherwise competitive with, the first-mentioned goods or services.

Distorted prices, in the sense of not properly reflecting costs, are particularly problematic where there is substitution and/or competition between different types of services, because it is important to ensure that decisions to switch between alternatives is driven by true cost and quality considerations, not by pricing anomalies. That is one of the principal reasons why cross-subsidies very often result in inefficient outcomes.

2.1.1 Competition between road and rail freight

There are effective substitutes for some heavy haulage road services in the form of rail freight and sea freight.[4] For example, in considering ARTC's access undertaking for the interstate network, the Australian Competition and Consumer Commission observed:[5]

> Some traffics, because of their size, weight, location or the distance for transportation are more suited to rail… For other freights there is more scope to transfer freight between modes, with some rail freights highly sensitive to the price or service offered by road or sea based alternatives.

The constraints imposed by competition from road transport has also been a prominent consideration in the regulation of the Darwin to Tarcoola railway. In the South Australian rail access regime the effectiveness of this constraint is such that "the market power of rail compared to road is considered to be low"[6]. The Harper Committee similarly observed that "many rail freight tasks face significant competition from road freight".[7] The Commonwealth's 2009 report on Australia's Future Tax System also noted

[4] It should be noted that some sea and air freight are substitutes for some land transport services, so the efficiency benefits of improved road pricing would extend more broadly into other transport modes.

[5] Australian Competition and Consumer Commission Final Decision (2008). Final Decision, Australian Rail Track Corporation, Access Undertaking – Interstate Rail Network, p.12.

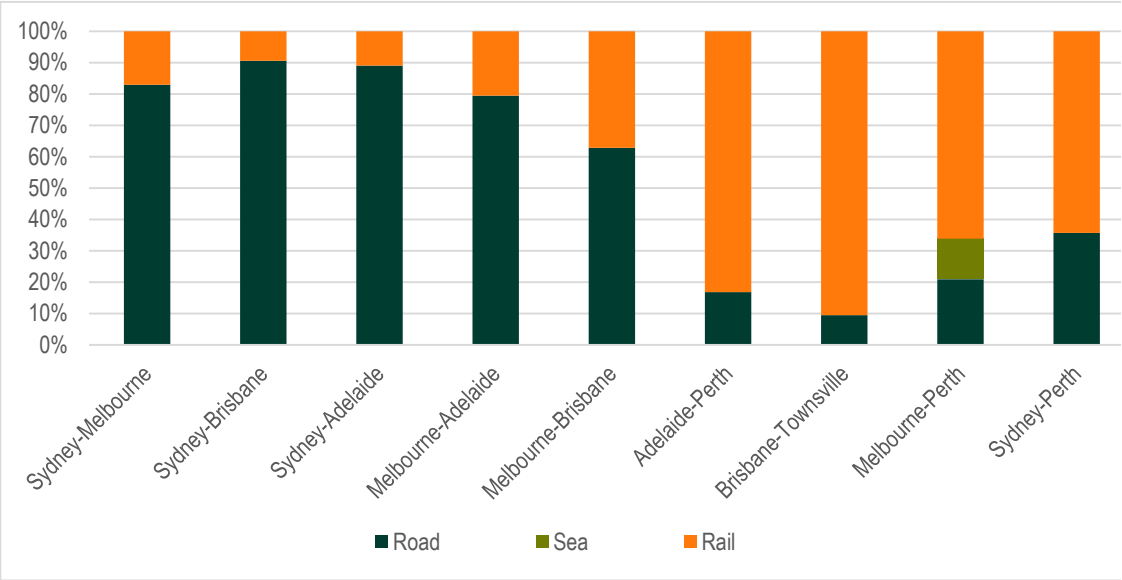
[6] Essential Services Commission of South Australia (2015). South Australian Rail Access Regime Review, Final Report, August, p.21. This was seen to apply for those railways subject to the *Railways (Operations and Access) Act 1997*.

[7] Harper Committee (2015). Competition Policy Review: Final Report, p.212.

that "on specific routes there is significant competition for freight between road and rail." [8]

The extent of this competition is evidenced by modal share, as provided in the following figure.

Figure 1 Estimated modal share by corridor - 2010



Source: Synergies analysis

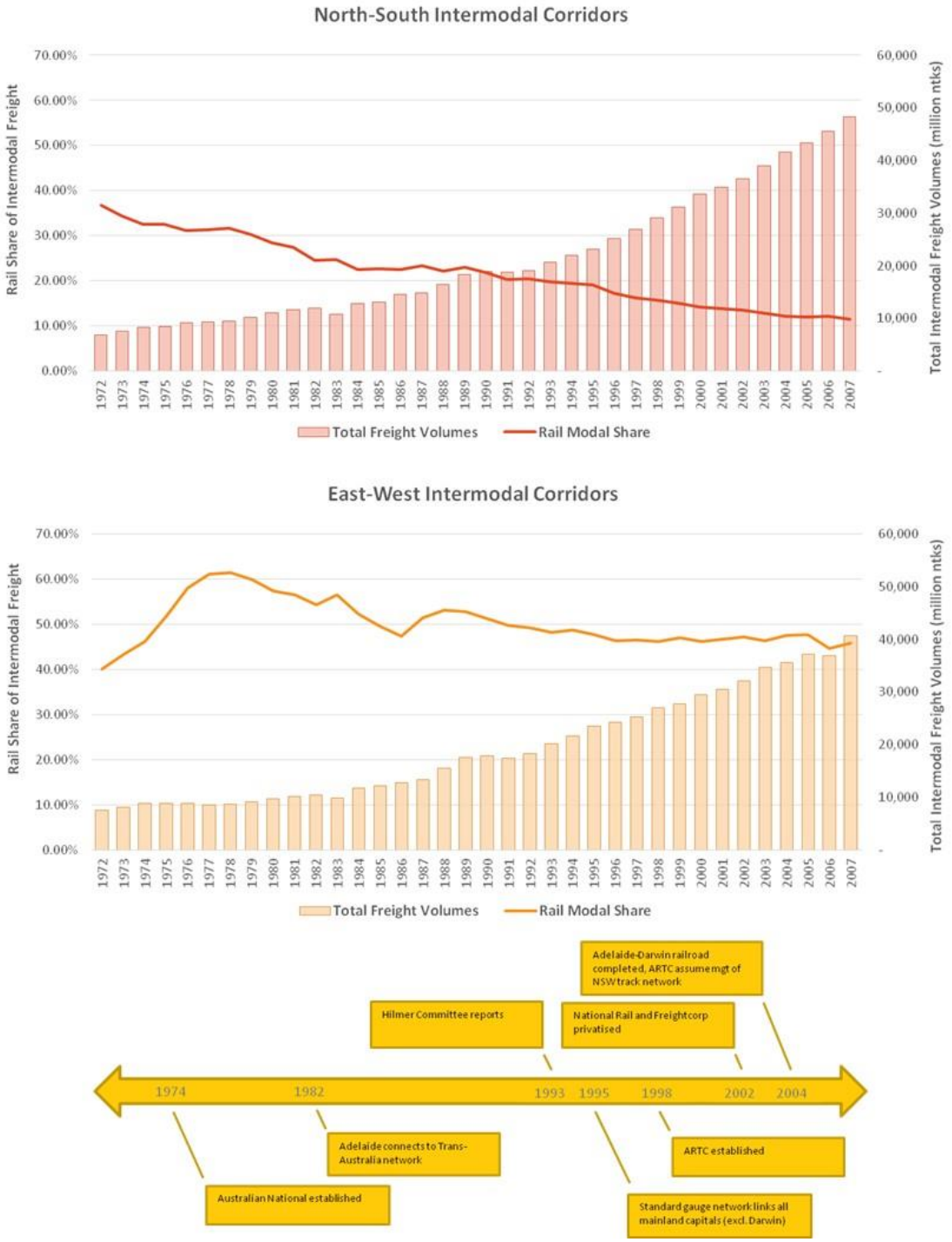
This shows that rail freight transport has a mode share of more than 70% on the east-west corridor whereas road freight transport achieves 60-80% share on the north-south corridor. Road freight is less significant on the east-west corridor given the distances and freight imbalances that exist; rail transport is more cost effective on this corridor.

We note analysis previously submitted to the Harper review by Aurizon that examined the change in rail's modal share between 1992 and 2007 on the east-west and north-south corridors.[9] This is reproduced below. It shows that despite the significant reforms that have occurred in the rail industry and significant budget funding, it has been losing modal share to road.

[8] Commonwealth Government (2009). Australia's Future Tax System, p.391.

[9] Aurizon (2014). Submission to the Competition Policy Review, Promoting efficiency, productivity and new investment in the Australian rail freight and export infrastructure sectors, p.38.

Figure 2 Aurizon analysis – changes in rail modal share



As evidenced above, the current modal share of sea freight is relatively low, with the most significant being the Melbourne to Perth corridor. We have not addressed sea freight in detail in this paper as the terms of reference related only to consideration of

the application of an appropriate economic framework for land freight transport pricing and investment.

Rail and road transport are not effective substitutes for all types of goods, with characteristics such as mass, density, type, perishability and fragility, distance and timeliness of delivery all influencing modal choice. Hence, for example, road is generally not a viable substitute for rail in the transport of bulk commodities such as coal due to the much lower cost per tonne hauling coal long distances by road rather than rail and the intense use of road such movements would entail. On the other hand, rail is not an effective substitute for the distribution of goods in urban areas due to widely dispersed freight destinations, nor is it as effective for the transport of time-sensitive cargos.

In practice, there are a number of freight markets where road and rail compete, including container freight, grain, fuel export containers, cement, aggregates and some minerals (such as mineral sands).[10] For current purposes, we define the scope of competition as the 'inter-city general and container freight market'.

The test used to establish the size of a market in national competition law is the hypothetical monopolist.[11] Applying this test, road and rail transport operators are unlikely to be able to raise their prices for inter-city general and container freight without losing market share. This means they are in the same market. The same outcome would not arise in respect of local general freight or coal haulage.

2.1.2 Conclusions: market definition

Noting a previous joint submission made by Asciano, Aurizon and ARTC in response to the final Harper report[12], we consider that for current purposes, a workable definition of this market is the inter-city general and container freight market, with heavy vehicle charging reforms limited in their application to:

- national highways and major arterial roads; and
- heavy vehicles weighing in excess of 4.5 tonnes, on the basis that: (1) this is currently the definition of a heavy vehicle for registration purposes; and (2) it is reasonable to assume that this vehicle type is predominant in inter-city road transport.

[10] The majority of this volume is carried on the major arterial road network (and the extent that it is carried on local roads, it is probably not in directly competitive with rail).

[11] If a hypothetical monopolist could not impose a small but significant non-transitory increase in price (SSNIP) due to the presence of substitutes, the market definition needs to be expanded. If a hypothetical monopolist of a road-only intercity general freight business sought to impose a small but significant non-transitory increase in price (SSNIP), it would be prevented from earning a monopoly profit by customers switching to rail and vice versa.

[12] Asciano, Aurizon and ARTC (2015). Joint Submission to the Australian Government in response to the Competition Policy Review Final Report.

The consequence of this market definition is that it will limit the pricing framework to the national road network, which is more consistent with ensuring competitive neutrality between road and rail (the importance of which is discussed further below). It will also allow the Commonwealth to more effectively lead its implementation.[13] Moreover, this market accounts for the bulk of the Australian non-bulk land transport task. The reforms will deliver proportionally greater gains and keep the task more manageable.

2.2 The economic problem to be addressed

The Transport and Infrastructure Council (the Council) has described roads as "the last unpriced utility", drawing parallels with the significant micro-economic reforms that have been implemented in energy and water. It has identified the need for an economic framework to apply to the pricing of heavy vehicle road infrastructure, stating that the ultimate goal of reform is "to turn the provision of heavy vehicle road infrastructure into an economic service where feasible."[14] Turning this provision into an "economic service" means having a pricing framework that encourages more efficient decisions as to what mode of transport (road or rail) is used by heavy transport haulage suppliers and end customers, as well as when and where to further invest in the road network.

2.2.1 Problems with the PAYGO model

The current PAYGO model used for heavy vehicle charging estimates the total cost of road use (including the cost of expanding road network capacity) and allocates a cost share to heavy vehicles. Under this framework, the National Transport Commission (NTC) recommends charges to be collected from heavy vehicle operators in two parts (these recommendations are not binding):

- a road user charge based on the effective rate of diesel fuel excise paid by heavy vehicle operators. This charge is set by allocating costs between vehicle classes based on fuel consumption. The effective diesel fuel excise rate for heavy vehicles is set and collected by the Commonwealth Government;
- an annual registration charge dependent on the configuration of the vehicle, which is set and collected by State and Territory Governments. The intention is to set the

[13] It also provides a more workable pilot for a pricing framework, which when optimised, could be rolled-out to other parts of the Australian road network by State governments.

[14] Transport and Infrastructure Council. Heavy Vehicle Road Reform – What we are doing and why we are doing it, p.3.

registration charge to recover the balance of costs attributable to each class of vehicle.

It is noted that the NTC's recommendations are not binding and are subject to Ministerial (i.e. Council) decision. The revenue streams are divided between Commonwealth and State/Territory Governments.

The key concern is that the current arrangements result in prices being levied on individual users that do not reflect the costs that their usage of the network imposes. This is particularly the case for heavy vehicles. For example:

- because the charges are calculated for the national network as a whole, there is no direct connection between the amount of road user charge paid per kilometre, and the condition or capability of the road being used (noting the higher standards required to accommodate heavy vehicle use);
- there is a lack of direct accountability from road providers to heavy vehicle users for meeting the specific infrastructure and infrastructure service requirements of heavy freight vehicles; and
- the current price determination methodology does not deal adequately with the timing and subsequent recovery of expenditure, and allocates only a minimal proportion of joint costs to heavy vehicles.

There appears to be general consensus that this current approach is flawed:

> The current system is characterised by poor links between the needs of users, the costs of infrastructure provision, the calculation of charges and the reinvestment of charges back into meeting the needs of heavy vehicle users.[15] (Transport and Infrastructure Council)

> PAYGO has a number of limitations, including cross-subsidisation among heavy vehicles and the fact that it provides limited signals for efficient investment.[16] (Productivity Commission)

> It is well recognised that the PAYGO methodology has a number of significant limitations, including the use of conservative assumptions and methodologies, which means that it is unlikely to recover allocated costs.[17] (Transport for NSW)

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15 Transport and Infrastructure Council, Heavy Vehicle Road Reform – What we are doing and why we are doing it, p.2.

16 Productivity Commission (2006). Road and Rail Freight Infrastructure Pricing, Report No.41, Canberra, p.73.

17 Transport for NSW (2013). 2013 Heavy Vehicle Charging Methodology Review, Transport for NSW Submission to the National Transport Commission, p.1.

> …road investment decisions are made in the absence of price signals about road network use that would indicate where increased capacity is warranted…Lack of proper road pricing distorts choices among transport modes: for example, between roads and rail in relation to freight…[18] (Harper Committee)

The NTC itself has recognised the limitations of the current methodology, stating that:[19]

> …there are some inherent limitations which cannot be resolved without wholesale reform of heavy vehicle charging. These limitations include:
>
> *Averaging* – Multiple levels of averaging will remain a feature of the current charging framework as more disaggregated data is not available at present.
>
> *Input data limitations* – The current usage data is survey based as opposed to observable actual usage data and this will continue in the absence of any clear cost - effective alternative.

In practice, these recognised limitations mean that the PAYGO approach can materially understate the incremental cost of providing heavy vehicle road infrastructure, including the necessary road design modifications to accommodate heavy vehicles. For example, roads need to be designed with increased pavement depth, gentler grades or additional lanes on those portions of the road with a steep incline and less tight curves. In summary, the outcome is that the price paid by heavy vehicles is independent of the cost incurred either in the past (return on initial investment), the present (operating and maintenance costs) or future (reflecting future capacity requirements).

In well-functioning markets, prices play a key role in signalling the costs of providing services, guiding efficient utilisation decisions (including decisions over whether to use alternative services), as well as informing where, when and in what form new investment should take place. Under the current arrangements, heavy vehicle charges are not providing these signals. As a result:

- as highlighted by the Harper Committee (cited above), current road prices tend to distort choices between road and rail in the carriage of freight. The (artificial) price advantage enjoyed by road distorts competition between the two modes[20]. Such distortions will not result in efficient outcomes for the market or the wider community as resources are not being allocated to their most highly valued use; and

[18] Harper Committee (2015). p.213.

[19] National Transport Commission (2013). Heavy Vehicle Charges Review – Discussion Paper, p.iv.

[20] The distortions in road pricing also impact the structure and level of rail charges.

- prices are not providing the correct signals to inform investment decisions, that is, where the next 'increment' of freight transport capacity should come from. Recognising the limited incentive road providers have to invest, prices need to be able to inform more effective investment decisions that will enhance the productive capacity of the economy and encourage innovation, which are central planks of the current Government's economic reform agenda.

2.2.2 New Zealand PAYGO model

A PAYGO approach is also applied in New Zealand, which is similar in many ways to the system currently applied in Australia.

Under the New Zealand approach, the cost of road investment is recovered from all road users via a petrol tax, vehicle registration, road user charges (RUC) and a contribution from local authority rates[21]. A RUC is applied to any diesel vehicle (which does not pay the petrol tax) and heavy vehicles over 3.5 tonnes. RUC is a mass distance charge that also varies by vehicle type (based on number of axles and tyres) with vehicles required to purchase distance licences for every 1,000km travelled on public roads[22].

The New Zealand system is based on the recovery of all investment costs incurred in the year in which they are made[23] (excluding any return on capital). It is not a forward-looking pricing framework. Current users pay the full cost of current investment rather than depreciating the asset over its expected useful life. When there is increasing or decreasing road investment, the cost imposed in one year may be more or less than the incremental cost of current users. This can create transfers over time as future road users benefit from previous investments.

The key shortcoming of the New Zealand system is its inefficiency, as charges are based on system-wide averages rather than costs imposed by individual users in particular areas or routes. The use of system wide averages rather than incremental costs can distort usage decisions and creates cross-subsidies between regions as the spending on road infrastructure varies significantly across the country[24]. The PAYGO system is also regressive due to the fixed vehicle registration costs. Another drawback of the New

[21] Ministry of Transport (2005). Surface Transport Costs and Charges: Main Report, prepared by Booz Allen Hamilton, p. v.

[22] NZ Transport Agency (2016). RUC Licences, https://www.nzta.govt.nz/vehicles/licensing-rego/road-user-charges/ruc-licences/#vehicle-type [accessed 31 March 2016]

[23] Road User Charges Review Group (2009). An independent review of the New Zealand road user charging system, report to the Minister of Transport, p. 45

[24] Road User Charges Review Group (2009). p. 22.

Zealand system is that charges are based on road use but are allocated based on an administrator's assessment of need.

Hence, while the New Zealand model is intended to achieve full cost recovery (across all users), it still suffers from the fundamental deficiencies of the Australian PAYGO model. It is not a forward looking model, nor does it provide meaningful price signals across and within different user classes, including heavy vehicles.

2.2.3 Enhanced PAYGO model

It is understood that the National Transport Commission (NTC) is proposing the introduction of an amended forward looking PAYGO system, referred to as the 'enhanced PAYGO' approach[25]. While limited details have been provided at this stage, we understand that this model could look to incorporate a forward looking cost base for expenditure on road infrastructure by incorporating the four year forward estimates that Governments have included in their respective budgets.

We understand that the NTC has referred to this as a 'building blocks' cost base although it is not clear what this is intended to comprise. It could simply be referring to the summation of the relevant cost components (i.e. capital expenditure, operating and maintenance costs). It is not evident as to whether this is intended to include a return on capital, or incorporates sunk costs (although to the extent that costs are based on forward Government budget estimates we expect that this is unlikely). It is therefore possible that the NTC's concept of 'building blocks' is quite different from the approach used in other regulated utilities, including rail, and does not reflect full economic cost (this is discussed further below).

While in theory, the inclusion of a forward looking cost assessment should be an improvement on the current model, the four year forward estimates of costs will not necessarily always reflect the most efficient long-term development path for each road network (as it is more likely to be focussed on addressing immediate bottlenecks rather than considering alternative scenarios that might optimise the utilisation of the network over the longer term).

More importantly, it is not evident that this approach will address one of the most critical deficiencies of the current PAYGO approach, which is its failure to provide clear and relevant price signals within and between different vehicle classes, including heavy vehicles, nor is it evident that it would address the current distortions between road and rail freight pricing. The exclusion of sunk costs also remains a significant issue, which as

[25] It is understood that this was indicated by the NTC in a presentation to stakeholders made on the 29th of March 2016.

noted above, is necessary to preserve investment incentives for infrastructure providers through ensuring an appropriate return on (and of) capital invested.

Based on the limited information available at this stage, we are therefore not of the view that an enhanced PAYGO model would address the fundamental problems with the current PAYGO approach.

2.2.4 The importance of competitive neutrality

As established in section 2.1.1, there is already competition between road and rail on the key freight routes. Rail access has already undergone significant economic reform, with transparent and cost reflective pricing applied and administered by national and state regulators. However, given the absence of similarly clear and cost-reflective price signals in road transport, modal choices are being distorted. This in turn means that while there is existing competition between road and rail, it is not effective.

The importance of competitive neutrality was originally identified by Hilmer in the 1993 report underpinning National Competition Policy reforms. It was identified that issues can arise where **"firms competing in the same market face different regulatory and other requirements, potentially distorting competition and raising efficiency concerns."**[26] While the focus of the Hilmer reforms was where Government was competing in the market for services, it recognised that these issues should be similarly addressed in markets served by private firms.[27]

The Commonwealth Government also recognised this in its 2009 review of Australia's Future Tax System. It observed that requiring heavy vehicles "to meet only the short-run marginal costs of the infrastructure they use raises concerns about competitive neutrality with rail."[28] That is:[29]

> Where access to rail is priced above its short-run marginal cost for cost recovery purposes, competition with road freight priced at marginal cost might lead to an inefficient allocation of freight between road and rail.

An effective road pricing framework would 'close the loop' between the supply of and demand for road infrastructure, and investment in that infrastructure. Prices can do this by rising in response to an increase in demand, requiring more efficient use of existing capacity (where feasible) or a need for new capacity. This will result in more efficient

[26] Hilmer Committee (1993). National Competition Policy, Commonwealth of Australia, Canberra, p.293.

[27] Hilmer Committee (1993). p.294.

[28] Commonwealth Government (2009). p.390.

[29] Commonwealth Government (2009). p.391.

decisions in balancing more efficient use of the existing network (i.e. a demand response) and more network capacity (i.e. a supply response). Alternatively, a long run pricing signal that is more stable could incorporate capital costs associated with the provision of road capacity for heavy vehicles. This is currently absent in road. It would also induce suppliers of freight services to make more efficient choices between road and rail.

In effect, this is competitive neutrality, which should be an outcome of a holistic and properly designed land transport pricing framework. It is only through the promotion of effective competition (or, letting markets work as they should) that we see reductions in costs, improvements in service quality and enhancements to productivity. In other words, ensuring competitively neutral outcomes between road and rail pricing will materially improve competition between the two modes in the general inter-city general and container freight market, which will maximise the benefits to consumers and further improve the productivity of the economy.

2.2.5 Summary: Why reform is essential

Pricing reform which results in prices that better reflect the costs of meeting the demand of different road users, including the costs of new capacity in the event that demand increases, could significantly improve the efficiency with which services are provided by promoting effective competition in the inter-city general and container freight market. This should comprise a pricing framework that reflects a clear and consistent set of economic principles (discussed below), noting that these principles have successfully underpinned pricing reform in other utility industries.

2.3 Objectives and principles

2.3.1 Core objectives and principles

Consistent with the *Competition Principles Agreement* (CPA) between the Commonwealth and States, the overarching objective of the economic framework for pricing land transport infrastructure should be to encourage the efficient utilisation of, and investment in, that infrastructure. The CPA provides that the following principle should be included in a State, Territory or Commonwealth access regime:[30]

> Objects clauses that promote the economically efficient use of, operation and investment in, significant infrastructure thereby promoting effective competition in upstream or downstream markets.

[30] Cl. 6(f)(1)

The other pricing principles in the CPA (which are similarly a standard feature of Australian access regimes, including rail) are that regulated prices should:

a) generate expected revenue for a regulated service or services that is at least sufficient to meet the efficient costs of providing access to the regulated service or services and include a return on investment commensurate with the regulatory and commercial risks involved;

b) allow multi-part pricing and price discrimination when it aids efficiency;

c) not allow a vertically integrated access provider to set terms and conditions that discriminate in favour of its downstream operations, except to the extent that the cost of providing access to other operators is higher; and

d) provide incentives to reduce costs or otherwise improve productivity.

Ultimately, the most efficient outcome is that every user pays a charge that reflects the incremental costs that their usage imposes on the network, including any necessary capital costs as well as opportunity costs[31]. It logically follows that the consistent application of these principles to all suppliers that compete within a market should promote efficient and effective competition within that market.[32] Hence, application of these principles to heavy vehicles will promote effective competition in the freight transport market.

2.3.2 Other relevant objectives

The 'core' objectives and principles set out above directly support the Council's stated objectives, by moving to a more cost reflective pricing structure that will encourage efficient utilisation and investment decisions. There may be other principles that are considered desirable, such as:

- transparency, which can reduce information asymmetries and improve accountability for pricing outcomes; and
- predictability, which supports future investment decisions made by market participants by reducing risk and uncertainty.

There are also other objectives articulated by the Council, a number of which may be integral to the design of the pricing framework:

[31] The consideration of externalities is not within the scope of this paper.

[32] Indeed, if the pricing mechanisms are inconsistent, the beneficiary can further exploit this advantage by capturing the difference between the two mechanisms as additional rent.

- directing revenues received from road freight charges into road investment[33], which should be the outcome of a socially efficient pricing framework;
- effective planning of the land transport network[34];
- allowing for transparent government funding of community service obligations[35], which is directly enabled by a more transparent, cost reflective pricing framework, noting that heavy vehicle pricing and investment reforms should prioritise the key freight routes which are likely to all be economic infrastructure; and
- as cited by the Council, oversight by an independent economic regulator or independent economic regulation arrangements.[36] It is noted that this would be helpful to the ongoing operation of the framework and consistent with the approach applied in other infrastructure industries. It will be important that this is addressed at the earliest stages of the development and implementation of a detailed pricing framework.

Ensuring an appropriate allocation of costs between heavy vehicles and the other classes of road users will be an important feature of the framework, which is now better enabled by technology.

2.3.3 Revenue neutrality

In its discussion of the need for road pricing reform, the Harper report suggested that the outcomes should be revenue neutral, which means that the reforms would focus on the reallocation of costs between classes of network users. However, this is not an economic principle or objective.

At least in the first instance, an economic framework that is intended to correctly price use of the road network by heavy vehicles needs to be allowed to determine what structure and level of prices would achieve the overarching objective, which is promoting efficient utilisation and investment in the relevant network infrastructure consistent with the CPA. The imposition of such constraints at the design stage is more likely to result in sub-optimal outcomes, which could lead to limited - if any -

[33] Transport and Infrastructure Council. Heavy Vehicle Road Reform – What we are doing and why we are doing it, p.3.

[34] Standing Council on Transport and Infrastructure (2013). National Land Freight Strategy – A Place for Freight, p.15.

[35] Transport and Infrastructure Council. Heavy Vehicle Road Reform – What we are doing and why we are doing it, p.3.

[36] Transport and Infrastructure Council. Heavy Vehicle Road Reform – What we are doing and why we are doing it, p.3.

improvements on the current arrangements, particularly if distortions in price signals remain.[37]

Revenue neutrality may be a transitional issue designed to smooth the path for the introduction of a pricing framework. The new pricing mechanism would reveal the extent of revenue shortfall overall and the transfers occurring between different categories of road users. Once these are revealed, transitional arrangements can be put in place for users to adjust to efficient prices.

Therefore, revenue neutrality should only be considered in this context, and should not be seen as either an objective or a principle of pricing and investment reforms.

2.4 Pricing options

2.4.1 Conceptual approaches

The concept of marginal cost

It is a well-established principle that when prices equal marginal cost, the supply and use of goods and services will be efficient. In the absence of congestion and externalities, 'marginal cost' is the cost of producing an additional unit of a good or service. In a market with many producers and consumers, market forces cause prices to move toward marginal cost.

However, infrastructure markets do not have a large number of suppliers due to the large initial investment costs. The resultant lack of competition means that infrastructure owners could raise their prices above marginal cost and customers would not easily be able to find an appropriate substitute. This may result in the need for regulation.

The situation can also emerge where there are competing suppliers in a market, but where each is subject to differing forms of regulation – in essence this is the problem in the inter-city general and container freight market (or between road and rail freight transport). Hence, while competition is occurring, it is not producing the economic efficiency benefits that are typically associated with effective competition. That is, it is not effective competition if those inconsistent regulatory frameworks are leading to distortions in competitive market outcomes.

[37] Importantly, we note that revenue neutrality has not been a consideration in the microeconomic reforms that have been implemented in other industries, with Governments generally willing to draw a 'line in the sand' in implementing forward-looking pricing methodologies, with some recognition of past capital contributions where readily attributable and measurable. We have seen transitional arrangements to full cost pricing in the water sector, in order to manage the price impacts for consumers.

This is a competitive neutrality problem, as originally described by Hilmer (refer section 2.2.4). In this case, assuming regulation continues to be necessary, a holistic and consistent approach should be applied to road and rail freight transport in the inter-city general and container freight market, with a view to promoting effective competition that will lead to increased efficiency and optimise outcomes for consumers.

The full incremental cost of heavy vehicles

In infrastructure pricing, marginal cost is commonly approximated by the closely related concept of incremental cost, which is the cost caused by a unit increase in demand. In the context of road infrastructure, the short run incremental cost of an additional heavy vehicle on the road is the wear that that particular vehicle creates, the external cost of fuel emissions and the longer travel time caused to other vehicles from additional traffic congestion. This paper does not address the issue of externalities and we understand that it is not proposed by the companies commissioning this paper that the recommended pricing reforms would include such costs.

In the long run, the incremental costs of providing road infrastructure for heavy vehicles need to reflect the necessary road design modifications to accommodate heavy vehicles, which as noted above, include increased pavement depth, gentler grades or additional lanes on those portions of the road with a steep incline and less tight curves. These design features reduce the wear caused by heavy vehicles and therefore the cost of transportation by road, as well as reducing travel time, providing a benefit to road transport companies.

In a hypothetical competitive market, road transport companies would be willing to pay the marginal cost of these design improvements up to the point where the benefits they derive from them outweigh the cost. This would give a price signal to road providers about the optimal type and level of spending on design modifications for heavy vehicles.

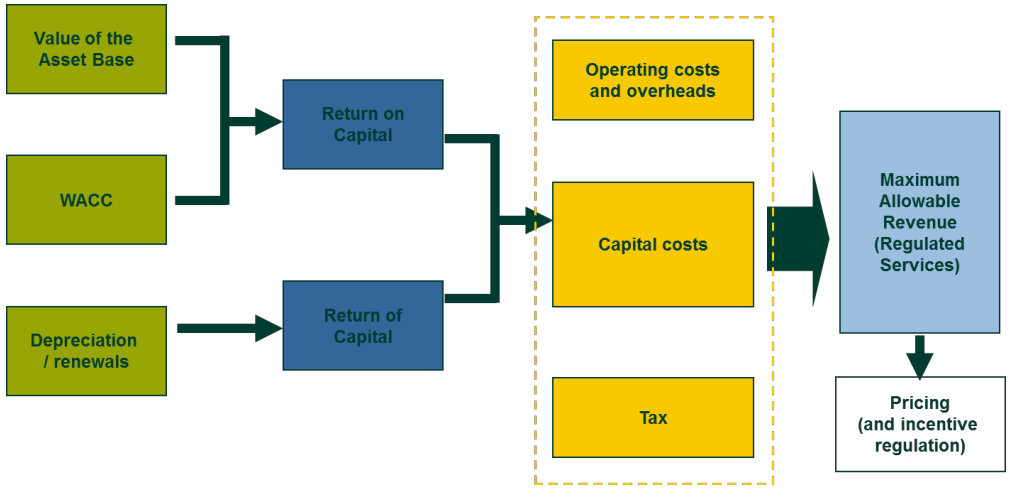
Any costs incurred in the building of roads that would not have been incurred but for the use of those roads by heavy vehicles would form part of the total service long run incremental cost of heavy vehicles and should be included in any economic framework for road pricing. This is the same principle applied in determining the economic cost of rail network infrastructure.

2.4.2 Main pricing approaches

If the Council's objectives and principles are to be achieved, the two main approaches that could be considered are Long Run Marginal Cost (LRMC) and the Building Blocks method:

- The LRMC approach is forward looking. It directly estimates the long run cost of service provision with and without an incremental increase in demand, including the need for capacity expansions.
- The Building Blocks approach establishes a maximum allowable revenue consisting of three main elements or 'building blocks' – return on capital, return of capital (or depreciation) and efficient operating and maintenance costs[38]. The Building Blocks approach is based on the costs that would be incurred by an efficient infrastructure provider (which can differ from actual costs) and an optimal expansion path.

Figure 3 Building Blocks



There is one important difference that should be noted at this point. LRMC is typically referred to in the context of setting prices (that is, where the price for a particular service are set to equal its LRMC). The Building Blocks approach is applied to estimate a total allowable *revenue* requirement, where that revenue is set to reflect efficient costs. Once this is established, prices are then set to recover that revenue based on an assumed volume or demand forecast.

At least for current purposes, it is useful to consider both on the same basis. That is, in the first instance, how can each approach be applied to determine the revenue that the infrastructure provider needs to be able to earn to recover its efficient costs (including a return on capital). The next step is to determine how prices will be set to enable that revenue to be recovered.

[38] It can also include an allowance for taxation.

Another approach, which is becoming more widely applied where there are peaks and troughs in demand for a services with fixed capacity, is the short run marginal cost (SRMC) approach. When networks are congested, an additional unit of demand creates a larger incremental impact than when the same network is not congested. A SRMC approach can provide more accurate price signals in order to alleviate capacity constraints that emerge in the short term, which could be done by altering utilisation decisions or if required, signalling when and where investment in additional capacity is needed. However, this will only be appropriate on those parts of the network that are congested (meaning that it is not necessarily a network-wide approach).

2.4.3 Challenges in application

LRMC

LRMC is theoretically appealing because it is forward-looking and attempts to set prices at marginal cost to promote economic efficiency. The LRMC approach measures the change in cost per unit increase in demand. The aim is to signal the current expected cost of the next increment of capacity. This involves forecasting what the next capacity expansion will be, where it will be, how much it will cost and when it will be required. Another key benefit of LRMC is that it avoids the need to allocate costs given prices are set to recover the LRMC of providing each service.

However, in practice, it has many flaws, chiefly relating to uncertainty about the future cost of creating capacity (and the optimal or most efficient future expansion path) and the fact that it does not maintain investment incentives on account of the infrastructure owner not recovering a return on (and of) existing capital invested.

Other issues in its application include how to establish a price when demand for services is declining (and no future infrastructure expansions will be required), what constitutes a 'long term horizon' and how capacity increments are defined.

If it is properly applied, LRMC should reflect the next increment of capacity needed to accommodate an increase in demand. This is important because in practice, the nature and cost of the next augmentation can vary considerably through time and will also depend on where the constraint emerges, resulting in a very 'lumpy' expansion profile, which will similarly result in more volatile revenue requirements and hence prices[39]. For example, at one point in time, the next increment of capacity might be building an additional passing lane on a steep grade. At another point in time, and/or in another location, this might involve realigning a significant stretch of road. If prices derived from

[39] Noting that some smoothing of prices may be able to be applied.

LRMC are efficient, they should accurately reflect this next increment of capacity. This will not be achieved by applying an average based on say, the next four years' of forecast capital expenditure.

As noted above, LRMC does not explicitly account for sunk costs, although to the extent that LRMC are currently above Long Run Average Costs (LRAC), which tends to occur at higher levels of output, some contribution towards sunk costs will be able to be made.[40] However, this also means that where LRMC is currently below LRAC (in other words, where the cost of the next capacity increment is less than the average cost of existing capacity), this will lead to a revenue deficit. In any case, it is extremely difficult to reliably determine this in practice.

The above difficulties mean that in its 'pure' or theoretically correct form, LRMC is rarely applied in practice. Instead, it is seen as a theoretical ideal or benchmark from which to assess more practical pricing models. Alternatively, some variant of LRMC may be applied that is still labelled as LRMC, even though it actually is not.

Building Blocks

In economic regulation the more commonly used approach is the Building Blocks methodology,[41] which also explicitly accounts for sunk costs[42] and hence is more readily applied to brownfields networks. The Building Blocks approach is a clear and transparent approach, allowing visibility through to each of the key cost components and how they have been derived.

One advantage is the ability to define an optimal expansion path through the Building Blocks framework as opposed to attempting to estimate the (unknown) shape of the LRMC curve. The Building Blocks approach is also appealing from the perspective of competitive neutrality, as modal choice reflects the incremental costs that a user imposes on the network.

It also recognises that the infrastructure networks already exist, allowing for a return on and of existing capital, where the value of that capital is reflected in the regulated asset

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40 An alternative approach that has been applied in telecommunications is the Total Service Long Run Incremental Cost model (TSLRIC). This forward-looking approach examines the total costs of servicing existing demand over the long run, where that service may use several different network elements. It therefore does account for the cost of existing assets however they are determined based on current technology (or a 'modern equivalent asset' approach).

41 The Building Blocks approach seeks to assess the full economic costs of providing the service, encompassing a return on and of capital, as well as operating and maintenance costs. In pricing terms, this full economic cost is translated into a 'ceiling price' which reflects the maximum price that could be charged in a competitive market before the user of the service is incentivised to bypass that service.

42 It explicitly accounts for sunk costs by establishing an opening Regulatory Asset Base (RAB). However, this does not mean that the value of that RAB will actually reflect the actual sunk investments that have been made historically (refer application of the Depreciated Optimised Replacement Cost approach).

base (RAB). Through the return on investment building block, heavy vehicles would pay for the services provided to them from the existing road network.

As noted above, there is some debate as to whether heavy vehicles have borne their share of costs historically and/or whether these costs have been fully recovered (although we would question whether this has occurred if heavy vehicle road usage has been systematically underpriced). This question is largely irrelevant to the design and implementation of an efficient, cost-reflective and forward-looking pricing framework that ensures that all classes of road user pay a price that reflects the costs of their usage (noting the design considerations previously referred to that are necessary to accommodate heavy vehicles).

A key issue in applying the Building Blocks approach is the definition of the initial RAB. Decisions would have to be made about whether to value existing assets at their current replacement cost or their actual/historical costs, noting that in Australia there is considerable experience with this, with most RABs being set based on a Depreciated Optimised Replacement Cost (DORC) methodology.[43]

The allocation of costs between heavy vehicles and other road users would also have to be established. Again, there is considerable established precedent on cost allocation approaches in regulated infrastructure industries that can be readily drawn on for developing an appropriate pricing arrangement for road freight charging on major freight routes.

Yardstick pricing approaches

A further alternative that may be identified is a 'yardstick' approach, which essentially sets prices by benchmarking against other comparable industries, firms or projects (for example, by benchmarking road infrastructure costs based on a recent new tollroad project). The intuitive appeal of such an approach is that it should more closely reflect the prices that are expected to prevail in a competitive market.

In practice, however, such analysis is fraught with difficulty as it can be extremely difficult to find suitable comparators enabling a proper 'like for like' comparison (at least in infrastructure). It will also not necessarily ensure competitive neutrality between road and rail. We therefore do not consider that such an approach would achieve the

[43] DORC assesses the current replacement value of the assets that are necessary to service current and future demand. The process applied by regulators to determine the DORC involves: identifying the relevant assets used to provide the service subject to regulation; establishing the treatment of contributed assets; estimating the replacement cost for the relevant assets as at the date the price setting process is to begin; adjusting the replacement cost for any optimised elements of the asset base to arrive at an Optimised Replacement Cost (ORC); and adjusting the ORC for depreciation, noting that the infrastructure will be treated as a number of separable elements.

Council's objectives and, thus, we do not believe it would be appropriate to apply it to price heavy vehicle road infrastructure.

Evaluation against pricing objectives and principles

The two main cost-based alternatives are:

1. A true LRMC (or long run incremental cost) approach, which does not explicitly account for sunk costs, but signals forward looking capacity costs.

2. The Building Blocks approach, which seeks to estimate the total costs that are solely attributable to the use of the road network by heavy vehicles.[44]

As noted above, this should initially be considered from a revenue perspective, that is, what revenue does the infrastructure provider need to earn in order to recover its efficient costs, including a risk-adjusted return on capital. The establishment of this revenue requirement should complement the objective of improving the efficiency of the inter-city general and container freight transport market and enabling freight operators to improve productivity. Once this revenue requirement is established, prices can be set to recover those costs.

A comparison of the LRMC and building block approaches against the key pricing objectives and principles described in section 2.3 is provided in the table below. This should be considered a preliminary assessment only. There are still a number of issues of detail that would need to be worked through in implementing each approach in practice. However, it is possible to draw some clear conclusions on the relative efficacy of each model at this point in time.

Table 1 Evaluation against criteria

Criteria	LRMC	Building Blocks
Encourage efficient utilisation of, and investment in, the infrastructure.	Satisfies criterion. Need to be able to identify the full incremental costs of heavy vehicle use of the road network, including investment and maintenance. This is extremely difficult to determine under the LRMC approach.	Satisfies criterion. Is a clear and transparent approach to determining cost reflective prices that is the most commonly applied method in Australian infrastructure regulation.
Generate expected revenue for a regulated service or services that is at least sufficient to meet the efficient costs of providing access to the regulated service or services and include a return on investment commensurate with the regulatory and commercial risks involved.	Refer above – risk is that LRMC approach will mean that heavy vehicles are not paying a price that reflects the costs associated with servicing them on the road network once account is taken of capital costs.	Noting that there is generally some debate as to how each building block component is derived, this methodology provides a clear and transparent means of building cost-reflective prices, including a return on investment.

[44] An alternative way to allocate costs between heavy vehicles and other road users is to estimate the total cost of providing the road network and deduct the incremental cost of the use of that network by all traffics other than heavy vehicles.

Criteria	LRMC	Building Blocks
Allow multi-part pricing and price discrimination when it aids efficiency.	More difficult to derive multi-part prices. Should enable price discrimination but only to the extent that there are differences in incremental costs.	Yes – multi-part tariffs are commonly applied in rail infrastructure regulation (and in other utilities such as water). Price discrimination tends to be limited to cost or risk differences.
Not allow a vertically integrated access provider to set terms and conditions that discriminate in favour of its downstream operations, except to the extent that the cost of providing access to other operators is higher.	This is independent of the pricing methodology and in any case, is not relevant to a road infrastructure provider.	
Provide incentives to reduce costs or otherwise improve productivity.	More difficult to impose explicit efficiency targets compared to the Building Blocks approach, as there is less transparency through to the underlying cost elements.	Regulators tend to address this in a number of ways: • building targeted efficiency gains into revenue or maintenance cost forecasts; • providing rewards for achieving efficiency gains through incentive schemes, or allowing the business to retain any efficiency savings (or a portion of those savings) for a set period; • once the starting price is set, escalating those prices at 'CPI minus x", where the X factor reflects an efficiency target. While this could be seen as more difficult to implement where road infrastructure is provided by Government, we note that in the regulation of other infrastructure sectors, such incentives are applied regardless of ownership.

While the two methods perform differently against the criteria, they are not necessarily mutually exclusive. As described above, LRMC is extremely difficult to correctly implement in its 'purest' form, although often remains a theoretical benchmark to assess alternatives.

In practice, the Building Blocks approach is the most common approach that has been applied in implementing economic reforms in infrastructure industries in Australia, which is still intended to be based on a 'forward looking' assessment of efficient costs. This includes explicit recognition of sunk costs, which has been an inherent feature of all building block methodologies implemented to date. As noted above, once the Building Blocks revenue has been set, prices can still be structured to provide more transparent signals as to the long run incremental costs of increasing capacity usage.

2.5 Is a consistent pricing framework required

It is important to recognise that pricing is a means to an end but should not be the end in itself. The ultimate goal should be ensuring efficient allocation of resources – the

question is how the pricing framework should be designed to advance this in an effectively planned or coordinated system.

Designing pricing outcomes to achieve competitive neutrality is an important principle underpinning this overarching goal, which will ensure more efficient modal choices, signal the costs of capacity constraints and inform better investment decisions. Requiring heavy vehicles to contribute towards the sunk cost of road network investment that has been committed to accommodate those vehicles on the road network is consistent with competitive neutrality and incentivising future network investment. It also ensures that investors in past network investment – which is the community (or taxpayers) – will receive an appropriate return on that investment.

However, it should also be recognised that there are a number of inherent differences between road and rail infrastructure that will impact the pricing framework. These include:

- the nature of capacity investment considerations:
  - what are feasible capacity increments in road versus rail;
  - what is the nature of capacity augmentation required in each mode;
- capacity utilisation:
  - this impacts the way in which costs are allocated (i.e. what costs does each user impose on the network) as well as the number and classes of users over which costs are allocated;
  - it also impacts on future investment decisions; and
- cost allocation considerations: what allocation approach will be used to allocate common costs between users and how will this be implemented.

Ideally, a single, consistent pricing framework for land transport infrastructure could optimise the achievement of the Council's objectives and reduce the scope for differences in the regulatory treatment between road and rail freight (other than where necessary) and, therefore, assist with minimising competitive distortions and, as a result, better inform modal choice and transport planning decision making. That is, if additional capacity is needed, should this come from road or rail and/or are there improvements that could be implemented to increase the utilisation of existing capacity on either mode.

If a single and consistent approach is not considered feasible, separate pricing frameworks could, at least on an interim basis, still be maintained, but where each has been designed based on a consistent set of principles with a view to achieving efficient modal choice, as well as informing efficient investment in each mode by ensuring both

road and rail users face cost reflective prices. As outlined below, this should preferably be administered under a single regulatory arrangement.

2.6 Implementation issues

As noted above, we have sought to scope out in this paper a possible economic framework that could be applied to pricing land freight transport at a conceptual level. There are a number of issues of detail that would need to be addressed, including the measurement and allocation of relevant costs.

One of the most important issues in implementation will be putting the appropriate institutional arrangements in place. Even if the same pricing approach is not applied to road and rail pricing, for the reasons outlined above it is important that a consistent and competitively neutral approach is applied in the application of the pricing objectives and principles, which should be administered under consistent economic regulation arrangements.

There are a number of options available for determining the most appropriate approach to economic regulation for freight transport[45]. As the Australian Competition and Consumer Commission (ACCC) currently determines access prices for the ARTC's interstate network, the ACCC would be one option available to the Government. Alternative arrangements could involve an access pricing regulator along the lines of the recommendation of the Harper Review or a national freight transport regulator (potentially sitting under an overarching utilities regulator).

The regulator or, alternatively, the consistent set of economic regulation arrangements, would have a specific focus on freight transported on key road freight routes, and the interstate rail network. It would also be responsible for monitoring outcomes under the framework and undertaking periodic reviews of the land transport pricing framework to assess whether it is meeting its stated objectives.

As noted previously, other implementation issues will include transitioning to the pricing arrangements, which may require the application of a price path.

2.7 Next steps

In terms of next steps, the first priority should be agreement of the pricing objectives and principles for both heavy vehicles using key freight routes and intermodal rail freight using the interstate network, with a view to delivering a framework that provides for

[45] A consistent set of economic regulation arrangements could involve a combination of a national and state economic regulators or a combination of state economic regulators.

competitively neutral pricing within the inter-city general and container freight market in order to maximise the efficient allocation of resources, productivity, innovation and overall community welfare.

As proposed above, the 'core' principles should replicate the CPA principles that underpin established infrastructure pricing regimes in Australia. There may be other objectives that need to be considered – some of these may be relevant to the design of the framework, others to implementation. Second, there should be a process, involving consultation with freight transport industry representatives, to:

- consider in detail all appropriate pricing options consistent with these agreed pricing objectives and principles; and
- develop a pricing framework that would best achieve these objectives and principles for both road and rail freight competing on the key road freight routes and the interstate rail freight network respectively.

Third, priority should be given to the determination of the appropriate land freight access pricing infrastructure arrangements. These arrangements should be confirmed at an early stage to ensure the development of the detailed pricing framework remains consistent with the agreed pricing objectives and principles. This would be consistent with the oversight responsibilities of independent economic regulation. This would help ensure that the Council is in a position to report to COAG on a transition to independent heavy vehicle pricing regulation by 2017-18[46].

[46] Australian Government Response to the Competition Policy Review, November 2015, p. 5.

A Heavy vehicle charging and investment structure and reform principles

To guide the implementation of heavy vehicle charging and investment reforms, it is proposed that the following principles be adopted by Governments and industry and, thus, be the key reference point for all aspects of implementation of heavy vehicle charging and investment reform:

1. **The reforms:**

- Should cover both Demand (pricing reform) and Supply (infrastructure provision/investment).
- Should only apply to heavy vehicles weighing more than 4.5 tonnes, and operating on major freight routes managed by Governments (national highways and state arterial roads).
- Would not apply to light commercial vehicles or passenger vehicles.
- Would not apply to regional and country roads.

2. **Pricing reform should involve:**

- Sending clear price signals to heavy vehicle users of road infrastructure based on the introduction of direct charges that fully reflect the actual costs of road infrastructure access and use, with prices for access to the road freight network determined by:
    - A building block regulatory pricing model (including Regulated Asset Base) and subject to approval by economic regulatory arrangements agreed by Governments and industry.
    - A direct mass, distance and location (MDL) charging system.
    - The use of in-vehicle telematics technology to measure road usage.

3. **Infrastructure provision (Investment) reform should require:**

- The development of road infrastructure plans and service standards that are consistent with commercial principles, and responsive to the current and future requirements of heavy vehicle users, including links to intermodal facilities, ports, airport and other significant freight infrastructure.
    - These arrangements should include a specific mechanism for heavy vehicle road users to propose infrastructure or service upgrades, and a process for the consideration and potential development of such proposals.
- State Government road infrastructure agencies/providers should be accountable for their performance in delivering infrastructure plans, including the provision of infrastructure service standards, with full transparency in these arrangements.

4. **Revenue from direct MDL user charges:**

- All revenue from direct MDL user charges should go directly to infrastructure owners/providers and be used for investment and other related costs associated with the infrastructure used by the heavy vehicles that incur direct MDL charges. Furthermore, it should be a requirement that revenue cannot be diverted to other uses.

5. **The integration of pricing and investment reforms:**

- Pricing reform based on direct user charging, and investment reform based on transparent infrastructure planning and provision, should be integrated from the commencement of the implementation process. This will promote the maximum productivity benefits from infrastructure investment by providers who will have an incentive to improve their performance in providing infrastructure and related services for the benefit of freight customers.

- That is, the reform steps should be adopted together as rapidly as possible, not separately, to maximise the achievement of the reform benefits.

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