PRODUCTIVITY COMMISSION INQUIRY INTO ROAD AND RAIL FREIGHT INFRASTRUCTURE PRICING

NTC Response to Discussion Draft Report

November 2006

National Transport Commission

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Abstract: This submission aims to outline a potential forward direction for the development of a new heavy vehicle pricing regime. It notes that price reform will be complex and costly, therefore a phased approach is preferred in order to test the benefits. Prior to reform taking place it will be crucial that a clear objective and set of principles for heavy vehicle pricing is articulated and that an appropriate governance arrangement for reform is established.

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FOREWORD

The Productivity Commission's Road and Rail Infrastructure Pricing Discussion Draft effectively drew a line in the sand and exploded a few myths along the way. It also hinted where the real future potential lies: a direct pricing signal to get the right investment in the right place at the right time.

This inquiry coincides with rising infrastructure investment by governments and Council of Australian Government (COAG) reforms for safer and more productive heavy vehicles, including B-triples. Closing the loop between what road users want and what the road asset owners can deliver through pricing is fundamental if Australia is to service the growing freight task efficiently.

The current system of averaged and aggregated charges is a blunt tool. Governments are naturally reluctant to embrace safer and more productive trucks that cause extra road damage when they are not compensated for that damage. And truck owners are reluctant to pay more if the money isn't spend on better and safer roads in the right places.

We also want a fairer outcome for smaller trucks, low kilometre applications and volume freight which inflict less road damage. And better equity for freight generators who plan their logistics networks around purpose built low-cost freight routes.

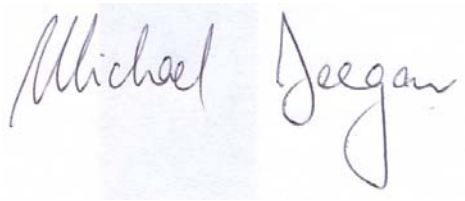
We know the benefits of safer and more productive trucks like B-triples, Super B-Doubles and quad axle groups are potentially large. But the Productivity Commission rightly cautions against moving blindly toward an expensive and complex heavy vehicle pricing system.

This response to the Discussion Draft outlines a responsible plan to move forward. It includes developing a business case for a staged approach to pricing reform, with feasibility studies and evaluations at every step for incremental and direct pricing, enhanced costing methodologies and new technology.

Changes to institutional arrangements for revenue collection and spending are potentially just as complex and costly.

COAG recently put transport back onto the national reform agenda. The Productivity Commission's final report could provide a powerful platform for COAG to drive both pricing and institutional reform forward, perhaps under the governance of a high-level taskforce. The challenge for all governments and stakeholders is to drive pricing reform cooperatively and sustainably. Now is the right time to start the journey.

The NTC acknowledges the work of the following members of the NTC Transport Pricing Team: Meena Naidu, Chris Egger, Amy McDowell, Tania Wilson, Barry Moore and Paul Sullivan.



Michael Deegan
Chairman

SUMMARY

The Productivity Commission has released its Discussion Draft Report as part of its Inquiry into Road and Rail Freight Infrastructure Pricing. The Discussion Draft makes many findings which the National Transport Commission (NTC) supports. These include the finding that competitive neutrality is unlikely to be resolved through pricing and that pricing may not be an effective mechanism to address externalities. However, perhaps most importantly, the Discussion Draft highlights the difficulties of the reform process, noting that whilst there may be considerable benefits, there are also considerable costs.

The NTC's response to the Discussion Draft therefore focuses on a process which enables the delivery of price reform for heavy vehicles. It further examines the potential benefits (particularly in productivity gains) of moving from a blunt charges regime to direct pricing for heavy vehicles. The benefits, particularly in relation to productivity, are believed to be very large – and could easily exceed the improvements in productivity under current arrangements such as Higher Mass Limits. The response also considers the challenges which will need to be addressed and will ultimately determine the extent of the reform.

What are we moving towards?

NTC believes that ultimately pricing regimes must provide choice. This ability is largely constrained in the road network by its current prescribed environment. Not only is infrastructure not being utilised to maximise its benefits but investment is not guided by market demand.

The current charges regime is blunt. Vehicles are charged an amount for access which does not necessarily reflect their actual cost of access. It assumes all freight movement is the same and that all roads derive the same value. However, this is not the case. The Discussion Draft described in considerable detail the diversity of the heavy vehicle road sector. A blunt charging regime which does not accommodate this diversity cannot effectively facilitate the choices that will ensure the existing network is utilised efficiently and future investment is targeted towards meeting future demand. Ultimately NTC believes there should be movement towards a pricing regime where the amount operators pay for access reflects the actual cost of their access. In doing so:

1. heavy vehicle operators should be given more choice about what vehicles they operate, where they operate them and how they operate them;
2. these choices need to take account of the total costs to society, in particular the costs to infrastructure providers both immediately and into the future; and
3. infrastructure managers should be better placed to take account of the choices operators make – if operators choose to use a road or cause a certain amount of road wear, having taking into account the costs (through the prices they have paid), then it is worthwhile for the infrastructure manager to invest in the road and to provide for the amount of road wear.

There are considerable rewards which could result from the right pricing regime. The cost savings available from productive vehicles is immense. For example, NTC has calculated an indicative estimate that the direct operational savings which accrue to *operators* as a result of running B-triples rather than B-doubles is around $120,000.[1] The total benefit is

[1] This estimate is based primarily on the savings in fuel costs associated with the reduced trips required to carry the same freight task in a year.

expected to be considerably higher, with less trucks being required to service the freight task and therefore lower costs for operators. However, the financial rewards can only be fully realised when asset owners provide the appropriate infrastructure. Right now owners are constrained from doing so by the lack of market signalling from prices and the failure of charges revenue to directly flow back to road agencies.

Ultimately, a new pricing regime could enable greater private sector solutions to infrastructure bottlenecks. This would assist public road agencies in resolving conflicts between commercially and socially driven infrastructure investment.

It is not only the heavier end of the fleet that could benefit through price reform. Those in the lighter end of the heavy vehicle fleet, or who do less than average mileage, would no longer pay over and above the cost they incur on the network. Given the increasing trend for 'just in time' operations and frequent distribution trips, this is expected to be an increasingly important benefit.

It is important to remember that pricing cannot achieve these benefits alone. NTC is aware of the constraints that prescriptive regulation has placed on the industry's ability to operate more effectively. It is committed to broader regulatory reform to safely enable better access to the network. This has included projects such as Performance Based Standards (PBS), the Intelligent Access Program (IAP) and Compliance and Enforcement (C&E). However, pricing is a key to unlocking productivity. This is demonstrated by increasing pressure of asset owners to find pricing solutions to complement the current reform program.

A plan for moving forward

As is clearly indicated in the Discussion Draft, price reform is not easy – particularly in the heavy vehicle sector. Broader price reform does need to be more comprehensively considered. It will be important for the requirements and cost of reform to be clearly considered in a business case before a final model is developed through a feasibility study. To adopt any other approach exposes both asset owners and the industry to the high risk that the productivity benefits sought will not be realised.

NTC's early scoping work suggests that a direct pricing regime is likely to achieve substantial productivity benefits. Ultimately, such a regime could price roads on a combination of road type, location and vehicle characteristics such as mass and axle load.

However, there is considerable uncertainty surrounding the value of the benefits of such a model. Therefore it will be important to take a staged approach to reform so that the net benefits of each step can be clearly demonstrated. A staged approach enables early testing of pricing features demonstrating that the policy decisions made as part of the process are effective and achieve the desired effect of realising productivity benefits. It also enables the early release of those benefits to those who have the most to gain and are therefore prepared to undertake the associated risk. Early testing of policy decisions will assist in demonstrating the viability of adopting technological solutions.

One of the first stages may be the implementation of an incremental pricing regime. Incremental prices enable operators of heavier vehicles to purchase enhanced access, i.e. the right to move more mass than the prescribed limits. Incremental prices are expected to be a crucial stepping stone for direct pricing. Not only will it test the appetite of industry for the right to carry additional mass, but also whether asset owners will sufficiently respond to demand signals, particularly in relation to upgrading infrastructure to meet demand.

The subsequent stage may be to reduce the averaging inherent in PAYGO through the adoption of an alternative costing methodology to better complement incremental prices. The phased roll out of a direct pricing structure could then follow which may ultimately utilise technology for charging as well as compliance.

The Discussion Draft importantly identifies the main constraint to the effectiveness of the current heavy vehicle charges and any future pricing regime – the current institutional arrangements. The report finds that the current arrangements (particularly the disconnect between heavy vehicle charges revenue and expenditure) create a barrier for effective infrastructure provision. However, this problem is not easily resolved. The report discusses various institutional models which may be applied to the road sector, including a road fund or a more commercial arrangement for road agencies.

Whilst the NTC does not have a particular view on specific models, it believes that changes to institutional arrangements may be as complicated (if not more so) than changes to the pricing regime. There are a number of issues to be resolved including who sets prices, who collects and allocates revenues and how road revenues will be spent. The costs associated with the models outlined by the Productivity Commission are considerable and it must be clear that there is sufficient benefit of moving to any particular model. The model must consider all asset owners (including local government) and should consider how it will co-exist with arrangements for light vehicles. Therefore, similarly to the development of a new pricing regime, considerable attention should be paid towards the development of appropriate institutional arrangements that will facilitate effective price signals. This work should form a related but separate work stream to the development of a pricing regime.

The reform process consists of several related streams of work, including development of a pricing regime, technology and institutional arrangements. To ensure these streams relate effectively to each other, a clear governance arrangement for the reform process needs to be established. NTC proposes that a high-level taskforce which reports to COAG may be the most appropriate arrangement. NTC would be well placed to support the Taskforce in the development of the pricing regime.

The next steps

NTC has been directed by the Australian Transport Council of Transport Ministers to undertake a new Heavy Vehicle Charges Determination to be delivered in 2007. The required timelines mean the Determination is likely to fall outside of the COAG process. Despite this, the Determination serves as an opportunity to ensure that at a minimum cost recovery continues whilst a new pricing model is developed.

NTC is cognisant that whilst a new pricing regime for heavy vehicles is being developed, there are already high productivity vehicles which are seeking access to Australian roads but which are not provided for by the existing charging regime. The potential productivity gains which would be lost by withholding a charging solution for these vehicles until a new formal pricing model has been developed are considerable. Therefore, in keeping with ATC directives, NTC has commenced work on developing charges for high productivity vehicles under existing principles to ensure that the efficient movement of Australia's freight task is not delayed by broader price reform.

Table ES1 below provides a possible timetable for price reform for heavy vehicles.

Figure ES1: Timetable for reform

Date	Action
Feb 2007	COAG meets and considers Productivity Commission Final Report. Informs Business Case.
April 2007	ATC meets and votes on the 2007 Heavy Vehicle Charges Determination
September 2007	**2007 Heavy Vehicle Charges Determination implemented**
October 2007	Business Case for Price Reform completed and submitted for approval
2007	Work commences on a new institutional framework
The following stages are dependent on development of the business case	
2010	**Stage 1 Reform** – Incremental pricing pilot (dependent on data collection and policy decisions)
2012	**Stage 2 Reform –** A new price review consisting of fully applied incremental prices and improved cost base
Post 2013	**Stage 3 & 4 Reform –** Partial and full application of direct prices

NTC is conscious that price reform is currently constrained not only by an absence of crucial policy decisions, but also by the limitations in technology and data availability as well as the inflexibility of the current costing model. Although these are not insurmountable issues, they will take time to resolve.

NTC, with Austroads, has already commenced a new data research program that in the first instance would improve the quality of data fed into the existing methodology, but which also has the flexibility to be able to be applied to a methodology which better supports direct pricing.

Whilst NTC acknowledges and welcomes the Productivity Commission's validation of PAYGO as an efficient costing methodology to meet the current charging objectives, going forward we believe the inflexibility of PAYGO and its averaging may mean that an enhanced PAYGO or whole of lifecycle costing approach may be required. Again, the costs and benefits of a movement towards either of these approaches must first be carefully considered.

Heavy vehicle price reform will be challenging. However, if the objective of a new regime is clear and a comprehensive process put in place, an appropriate regime can be developed that will better ensure maximum productivity of the heavy vehicle fleet and road infrastructure and better enable the future freight task to be met.

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1. INTRODUCTION

The Productivity Commission has been charged with an ambitious task. Its terms of reference seek to ascertain the problems underpinning road and rail infrastructure pricing which may contribute to the competitive neutrality problem, consider the case for adopting a form of mass distance location pricing, as well as options for doing so, and develop an approach to implementation.

Following the release of its Issues Paper and considerable subsequent consultation, the Productivity Commission released a Discussion Draft Report (Discussion Draft) which successfully creates a platform from which price reform can be launched. A common understanding of the current land freight environment is crucial to ensure any reform is targeted to deliver the required benefits.

1.1 A challenging freight task

The Discussion Draft accurately describes the current land freight environment. It states that in order to meet the anticipated doubling of the freight task the most efficient mix of modes is required and each mode must operate efficiently (PC 2006, p 1.2). Pricing will be crucial to enabling this efficient operation, particularly in the road sector where current heavy vehicle charges are blunt and are ineffective in providing any sort of pricing signal. Doing nothing is no longer an option.

The NTC has long been aware of the need for a change to particularly the heavy vehicle road charging regime. The urgency has been highlighted by a reluctance to provide access to highly productive heavy vehicles (such as B-triples) without a fair charging solution.

Of more immediate concern is the probability that heavy vehicles are unlikely to continue to pay their way in the near future. Current expenditure data received by NTC shows the over-recovery of heavy vehicles continues to fall and according to the figures used in the Third Determination stands at around $29m[2] per annum. Given that total road expenditure in 2005/06 equalled $6,114m, at less than 0.5% of total expenditure this is considered well within the margin for cost estimation error. Appendix A discusses this in more detail. All indications are that considerable expenditure will be made on road infrastructure over the short to medium term. Failure to recover even the base expenditure will jeopardise any attempt to enable greater access to the network. Further, road agencies will need to feel confident that they can access the revenues of those vehicles which are prepared to pay for the additional damage that greater access results in.

1.2 Competitive neutrality

Competitive neutrality has been an important and controversial issue for some time with considerable divergence in views. At the heart of this debate is the differing costing methodologies for road and rail. Road adopts a pay-as-you-go (PAYGO) approach. This

[2] This figure has been calculated as follow ($bn in each case): 1.095 in fuel charges + 0.553 in registration charges equals 1.648 in revenue, less allocated costs of 1.619 equals a $0.029 over-recovery. NTC would expect this over-recovery to reduce further with the latest expenditure figures. It should be noted that ATA estimates the over-recovery to be considerably higher, however, their calculations include revenues from vehicles which are not classed as heavy vehicles as well as double counting of vehicles that do not receive the fuel rebate.

assumes that capital, maintenance and operational expenditure is recovered in the year that is incurred. Rail, on the other hand, spread the recovery of capital costs over the life of the asset and as such includes a return of *and* on investment. Historically the argument has been that heavy vehicles under recover their costs and that PAYGO includes an inherent subsidy. As a result it has been argued that road freight benefits from an unfair competitive advantage. The Discussion Draft has comprehensively discussed this issue. It reviewed PAYGO and concluded that there is no inherent subsidy. The NTC agrees with this point. However it notes that historical expenditure (which is the basis for PAYGO cost estimation) is likely to be an inaccurate proxy for future expenditure due primarily to the current institutional arrangements. These arrangements create uncertainty in funding streams and do not promote efficient expenditure.

The Discussion Draft also included modelling which showed that even if prices were to increase on the contestable routes, there would not be a material modal shift. This would suggest that road freight is relatively price inelastic. It is less clear that this is the case for rail freight. The Discussion Draft suggests that rail freight it more price sensitive. As such, it is difficult for adequate infrastructure investment to be undertaken in the sector and for that expenditure to be recovered through rail prices. It is therefore suggested that higher road prices would ease this pressure somewhat. However, the NTC would also suggest that improvements in rail service quality may also enable the rail sector to pass through infrastructure costs.

1.3 Externalities

There has been a strong desire by interested parties in both the road and rail sector for externalities to be included in infrastructure access charges. The key externalities in question are noxious emissions, greenhouse gases, noise, congestion and safety.

Currently neither road nor rail charges incorporate these costs. The Discussion Draft found that external costs associated with road freight are higher than those associated with rail freight. However, it also found that most of these externalities appear to be significantly internalised.

NTC supports this view. It also notes a number of regulatory requirements have been implemented or which are in the process of implementation. These include chain of responsibility legislation, performance based regulation and fatigue reform to address safety. Noise is being tackled with new monitoring technology to assist in compliance and enforcement. Vehicle and engine design standards also address noise and emissions.

NTC view these externalities as largely being associated with the operation of vehicles as opposed to the provision of infrastructure. Whilst fuel or access charges may assist in recovering any residual cost which has not already been internalised, it is unlikely to be effective in changing behaviour. However, further work, as recommended in the Discussion Draft, would be prudent in resolving the level of internalisation of externalities.

1.4 A “traditional” approach to pricing?

Network based economic regulation is not new. Access prices in other sectors such as water, electricity, gas, telecommunications and rail are all regulated to varying degrees throughout Australia, generally following tried and tested approaches to market reform (such as corporatisation) and setting prices (generally adopting a CPI-X approach). It is often questioned why the road sector should not be subject to the same form of “traditional” economic regulation.

The Discussion Draft considers this. It highlights the difficulty in adopting traditional infrastructure pricing approaches in the road sector due to the complexity and diversity of the infrastructure, the diversity in the fleet and freight task and the complexity of the supporting institutional frameworks. Furthermore, unlike other infrastructure assets, use of the asset has a stronger relationship with expenditure.

The NTC understands that whilst the traditional approach is ideally preferred, the costs of implementing such an approach possibly far outweigh the benefits. For example, it has undertaken initial studies to consider how the current cost estimation approach of PAYGO could be replaced with a more forward looking economic approach.[3] To do so is not easy, particularly when looking at a partial market of only heavy vehicles. It is also not clear if the improvement in cost estimation would be anything more than marginal and would justify the cost of changing the approach. Although difficulty in applying an approach does not mean it should be precluded from consideration, it does mean that there must be a clear benefit associated with the change. Therefore, NTC believes it is more important to understand the objectives behind economic mechanisms and adjust existing mechanisms (or develop new ones) which are more appropriate for the road sector.

1.5 The importance of regulation

Pricing does not work in a void in achieving productivity gains. Instead it works within a broader regulatory framework which ensures that greater access can be provided safely. NTC's current reform agenda has revolved around accessing productivity gains through programs such as Performance Based Standards (PBS), Intelligent Access Program (IAP) and Compliance and Enforcement (C&E). The Discussion Draft has acknowledged the importance of these programs through the recommendation that the announced timetable for PBS is met. However, these programs are at the limit to what they can achieve without a pricing solution to tackle the infrastructure barrier.

1.6 Structure of this submission

The Discussion Draft has been successful in addressing many of the issues which critics of the current regime have argued heavy vehicle charges should address. It has clearly stated that heavy vehicle road pricing will not resolve competitive neutrality and that externalities are probably best addressed by other mechanisms. It has discussed how the road network is different from other network based sectors which are regulated and therefore traditional regulation may not be so relevant.

However, although the Discussion Draft discusses general pricing principles, it has not clearly articulated what *heavy vehicle* pricing should achieve – that is, what the objectives should be. The remainder of this submission attempts to answer this and in doing so suggests a potential approach which would meet a specific objective and result in clear benefits for both the industry and asset owners. The remainder of this submission is structured as follows:

Chapter 2: This chapter provides a discussion of an objective for heavy vehicle charges which addresses the problem facing the industry of investment constraints. It also identifies the type of benefits which would be available by meeting the objective.

[3] NTC Submission 73 to PC Issues Paper on Road and Rail Freight Infrastructure Pricing.

Chapter 3: Chapter 3 outlines a broad model of direct pricing to meet the objectives and principles outlined in chapter 2. It highlights stepping stones in the development of an ultimate model as well as the challenges which will need to be addressed.

Chapter 4 This chapter describes in greater detail the next steps which may be required in moving towards price reform.

Chapter 5 Chapter 5 summarises the submission with concluding remarks.

2. PRINCIPLES AND OBJECTIVES OF HEAVY VEHICLE PRICING

As the Productivity Commission Discussion Draft (the Discussion Draft) has indicated, price reform in the roads sector is complicated. The challenge is not only to identify sound economic principles for pricing, but also the objectives which pricing should address through the application of those economic principles.

In doing so, it is important to consider the problem which faces heavy vehicles and why the current charging framework is unable to alleviate the problem. As will be discussed, one of the key challenges is to ensure that in a market which is broader than heavy vehicles, that heavy vehicle needs of the road infrastructure are being efficiently met and that the appropriate signals are being provided for the efficient movement of land freight.

The current objective for heavy vehicle charges is to ensure that vehicles classes recover their total allocated cost of use of the network. To achieve this objective, NTC is guided by a number of often conflicting principles, and as a result of this conflict, as well as constraints on the pricing model, some classes of heavy vehicles over-recover their total allocated costs, whilst others under-recover. However, in aggregate, heavy vehicles have historically over-recovered. The Discussion Draft discusses this in considerable detail noting that whilst this is true historically, it is unlikely to continue to be the case given the considerable increases in road expenditure anticipated to address the future freight task. Furthermore, the Discussion Draft has reviewed the NTC cost estimation and cost allocation methodology and endorsed it.

Going forward, increased demands are likely to be placed on the road network resulting from the increased freight task. This has two related implications. The first is that heavy vehicle related investment will possibly be given a higher priority. The second is that if this does occur, it will necessarily mean that more expenditure will need to be allocated to heavy vehicles – the attributable cost of heavy vehicles may increase as well as total allocated expenditure. As such it will be increasingly important that there is a clear objective and set of principles for heavy vehicle charges to ascertain whether charges are simply a revenue collection mechanism or are a more meaningful tool in an increasingly dynamic environment.

2.1 The Discussion Draft principles

The Productivity Commission has referred to the key economic principle of efficiency in the pricing of road and rail infrastructure. In doing so it suggests that:

- vehicles in total should recover the total cost of infrastructure provision;
- individual users should recover at least their long run marginal cost;[4]
- price discrimination should be ideally used to recover common costs; and
- vehicles should recover economic costs.[5]

[4] The NTC notes the Discussion Draft has indicated that the attributable cost is equivalent to long run marginal cost. The Discussion Draft also notes that if vehicles recover at least their attributable cost, they are not being subsidised.

[5] The Discussion Draft suggests that this is the recovery of expenditure on efficient investment. Therefore it is assumed that the investment decision factors in externalities associated with infrastructure provision.

Whilst these are important principles which any pricing structure should ideally adopt, it does not sufficiently address a specific *objective* for heavy vehicle charges. In order to do this, it is important to understand what the problem is for heavy vehicles in the current environment and what efficiency means in the context of road infrastructure provision.

2.1.1 What does efficiency mean?

Before discussing what problems are facing the road freight sector in achieving efficient outcomes, it is helpful to have a clear understanding of the term "efficiency". Efficiency is a concept which recognises that resources are scarce and therefore should be utilised in a manner which maximises their benefits. The Discussion Draft states that

"economic efficiency requires that, through time, the appropriate levels and qualities of goods and services are produced at least cost, with optimal levels of consumption and production (and investment), brought about by prices reflecting marginal social cost."(PC 2006)

There are several types of efficiency which should be considered in the provision of road services. The most prominent is allocative efficiency. This is where resources are directed or allocated to the area that derives most benefit. There are two ways this could be interpreted in road provision. The first is the extent to which resources are allocated appropriately within the road network (i.e. is right investment being made on the right roads that derive the maximum benefit). The extent to which an investment is considered efficient for heavy vehicles in this situation is largely dependent on the value derived by The second is the extent to which resources are appropriately spent on roads relative to other sectors. This form of allocative efficiency has been at the heart of the competitive neutrality debate.

The other key form of efficiency is productive efficiency. This addresses whether resources are being used at their optimal level, thereby reducing overall costs. In the roads context this essentially means whether investment being undertaken in the least cost manner, that is, without wasteful practices.

However, it is important to remember that to a greater degree than other network based sectors such as electricity and water, freight infrastructure pricing is not simply about providing a signal on the supply side (i.e. for efficient road infrastructure) but also on the demand side (i.e the mode of transportation whether that be by rail or specific type of heavy vehicle). Prices can signal to users what the most appropriate vehicle and mode is to transport a particular task which will maximise the value of a trip. Further upstream infrastructure charges give clear signals to businesses in adopting the right logistics strategies, including optimally locating freight distribution and receival points and choosing optimal stock flows. Efficient infrastructure provision simply facilitates these decisions. The question then remains, to what extent is this a problem? Does the current pricing regime provide a sufficient signal to enable efficient operation supported by the required infrastructure?

2.2 What is the problem?

This is the key question which needs to be answered in order to provide an objective for heavy vehicle charges.

The Productivity Commission principles revolve around the efficient provision of heavy vehicle infrastructure. Whilst in the rail sector this can be more easily tied to a freight network, the same is not true for roads. This is due to the fact that the road network is a

mixed one with heavy vehicles consisting of less than 5% of the road fleet or 20% of vehicle kilometres travelled. The question then remains whether heavy vehicles have a different problem to general road users and, if so, whether pricing address this problem.

2.2.1 The problem facing all road users

Road infrastructure is provided for road users in general to address the following issues:

- general access: enabling free movement of goods and people;
- safety: ensuring that use of the road network does not compromise the safety of those on or around the network; and
- congestion: ensuring that the time spent on the road network is optimised so the productive (economic) value of those on the network is maximised.

Although there is an economic value associated with these issues, the provision of infrastructure to address them could be viewed as primarily socially driven in that society as a whole benefits to a far greater extent than the individual. It is on these grounds that vehicle charges are seen less as a charge for the provision of road services, but a form of taxation for the government to reallocate to public services as required (whether they be for roads or not).

It is important to note that these issues are not limited to light vehicles. Heavy vehicles also benefit from the provision of services to address these issues. If providing safe general access were the only problem, a robust cost-benefit approach to determining investment will probably derive an efficient result (although as will later be discussed, may be dampened by the institutional framework).

2.2.2 The problem facing heavy vehicles[6]

As with any commercial venture, road operators are profit driven. Therefore they have commercial incentives to maximise productivity and service quality in order to maximise competitiveness and profitability. Whilst the drivers of investment discussed above do contribute to the productivity of heavy vehicles, greater requirements of infrastructure are required to satisfy commercial objectives. These requirements generally revolve around greater access to the network and the removal of infrastructure bottlenecks.

Access to the network is determined by mass and dimension limits. Generally speaking, those parts of the network that have been designed to a higher standard are accessible by heavier vehicles. However, heavier vehicles incur a greater cost on the network than lighter vehicles. The increase in the use of these vehicles means that maintenance costs for asset owners increases and/or the life of the asset reduces. Similarly an increase in the allowable mass of heavy vehicles will also have an impact on the life of the asset. However, the increased cost or reduced asset life associated with particularly enhanced use (i.e. greater mass) is generally considerably less than the associated benefit. The benefit flows beyond the value of an individual trip; if a vehicle is able to carry greater mass, then fewer vehicles will be required in total to carry the total freight task. Because of the considerable benefits

[6] It should be noted that heavy vehicle charges are not limited to freight vehicles but also apply to buses. The implications for buses are considerable given they generally operate under regulated tariffs and therefore require a degree of certainty in access charges to enable them to adequately represent themselves in tariff reviews or contract renegotiations.

associated with carrying additional mass, a rational operator should be willing to pay the additional cost of doing so.

At the same time it is important to remember that not all freight and freight movement is the same. Whilst there are a number of vehicles that are on the heavy end of the spectrum in terms of freight task, there are also a large number of vehicles which carry a relatively light freight task and are constrained by the limits of their dimensions rather than mass. Further, there are vehicles that operate on only short distances or for only part of the year. This is particularly true for agricultural vehicles.

However, the current road charging regime is blunt. Usage is assumed to be uniform within classes and the diversity within the fleet, freight task and road type is not adequately taken into account. Charges provide no information to asset owners about what infrastructure is required for current and future efficient operation nor does it provide information to road operators about the true cost of their access so that they can utilise the network efficiently through route and vehicle choice and signal market value. For heavy vehicles, the efficiency problem is not limited to only infrastructure provision, but also to operations.

Figure 1 demonstrates the problem. Up until the 1990s considerable productivity gains were made with consistent increases in mass. This can generally be attributed to the introduction of new vehicles which could physically carry greater mass, rather than an infrastructure constraint. However, in recent times these increases in allowable mass have slowed due to the concern of asset owners that an increased cost will be incurred yet revenues *received by asset owners* will not be sufficient to meet the cost. To a large degree, improvements in institutional arrangements would go some way to addressing infrastructure investment. However, making revenues more available to road agencies does not necessarily better enable them to provide infrastructure at an efficient level for *heavy vehicles*. As discussed above, the relatively small size of the heavy vehicle fleet as a proportion of the total road fleet means that their voice may still not be heard. A direct price structure would provide a stronger signal to agencies as to heavy vehicle requirements and would also enable road operators to choose a (safe) level of consumption which would maximise their individual benefits.

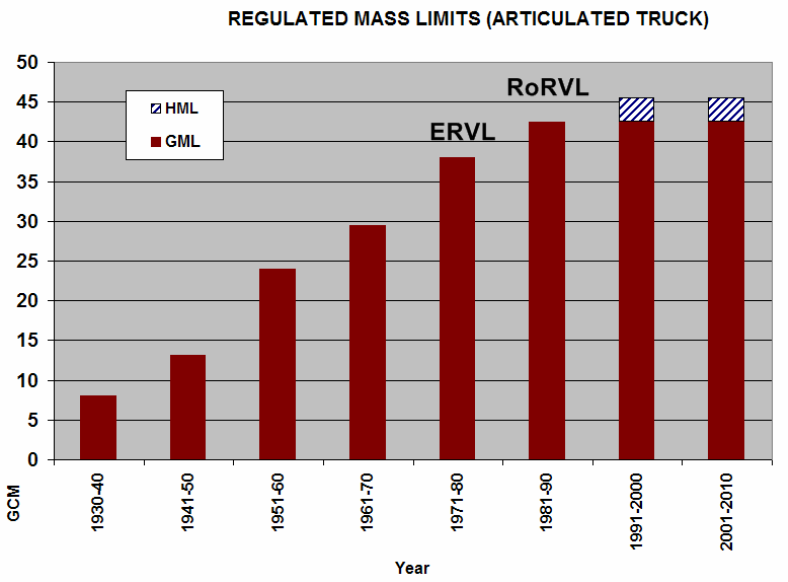

Figure 1. Regulated mass limits over time.

2.3 The objectives and principles of heavy vehicle pricing

The discussion above leads to a theme of choice underlying the objective of heavy vehicle pricing. Broadly this could be described by the following:

1. heavy vehicle operators should be given more choice about what vehicles they operate, where they operate them and how they operate them;

2. these choices need to take account of the total costs to society, in particular the costs to infrastructure providers both immediately and into the future; and
3. infrastructure managers should be better placed to take account of the choices operators make – if operators choose to use a road or cause a certain amount of road wear having taking into account the costs (through the charges they have paid), then it is worthwhile for the infrastructure manager to invest in the road and to provide for the amount of road wear.

This objective is consistent with the broad principles the Productivity Commission has outlined as discussed in section 2.1 above. These principles could be further interpreted for heavy vehicles in the context of the objectives described above as being:

- heavy vehicle operators should choose, and pay for, how much road wear they consume;
- individual heavy vehicle road users should pay at least the long run marginal costs of what they consume;
- heavy vehicles should pay, at least in aggregate, their share of fixed costs; and
- heavy vehicle road infrastructure prices should provide for route, trip, load level and vehicle choices that reflect the lowest total costs to society as a whole.

At a different level, an objective of the pricing system or arrangements (as distinct from the prices themselves) might be to ensure that the arrangements are cost effective in meeting the pricing objectives, administratively simple and practical. This is an important consideration in designing any new pricing arrangements.

2.4 The specific benefits being sought

There are a number of key benefits which could accrue from the application of these principles to meet the discussed objective. It is important to note that it is unlikely that pricing alone can achieve them. It must be supported by the appropriate institutional arrangements, regulations and effective compliance and enforcement. The remainder of this section discusses these benefits in more detail.

2.4.1 Greater access to the network

The key benefit of price reform of heavy vehicles is the enabling of more productive vehicles gaining access to the network.. This includes new categories of vehicles like B-triples as well as vehicles with heavier loads which cause more road wear. The operational cost savings associated with B-triples access the network are estimated by NTC as being in the region of $120,000 per annum. This is a conservative estimate of primarily fuel savings, which assumes a constant freight task and does not take into account revenue streams from the task itself. The associated infrastructure cost is around $25,000 per annum more than B-doubles. The reluctance of road agencies to approve access of these vehicles to the network is an excellent example of how current pricing arrangements are stifling productivity.

As has been discussed, the reason why this barrier is being created is that road agencies are not prepared to allow greater damage to the network without some form of compensation to ensure they can continue to maintain the road at the required standard. Simply increasing PAYGO expenditure to reflect increased road agency is unlikely to be an adequate mechanism. This is because the current costing mechanism relies on averaging to

allocate expenditure across vehicle and road types. Further, the price structure attempts to achieve a specific revenue split between federal and state governments (as a whole). It does not attempt to achieve either a vertical or horizontal fiscal balance. That is, it does not try to balance revenues with expenditures between federal and state government or between state governments. Therefore the cost of additional access may not necessarily be recovered by the asset owner affected.

2.4.2 Dealing with the infrastructure gaps

One of the more significant benefits of a direct pricing regime is the ability for vehicles to signal investment in infrastructure barriers. These barriers can be referred to as missing links as they reflect a gap in a defined network which can reduce the value of a particular route by effectively blocking access. They are generally short stretches of road or bridges which are of a lower standard than the adjacent sections of the network. It is relatively common for these missing links to exist on roads leading off major roads providing access to distribution points. The cost of upgrading these part of the road network is for the most part disproportionately lower than the benefit derived by those who wish to operate on them at the higher standard. A new approach to pricing provides a clear signal for assets owners of the need to invest in the gaps in defined networks through a pricing mechanism which enables road operators to pay for the investment. In doing so, the full potential of a route can be realised.

This problem is demonstrated in Figure 2 which shows a section of a potential B-triple network under the Performance Based Standards project. The map shows a particular route which would not enable a B-triple to operate in a B-triple configuration over the entire length of the route[7].

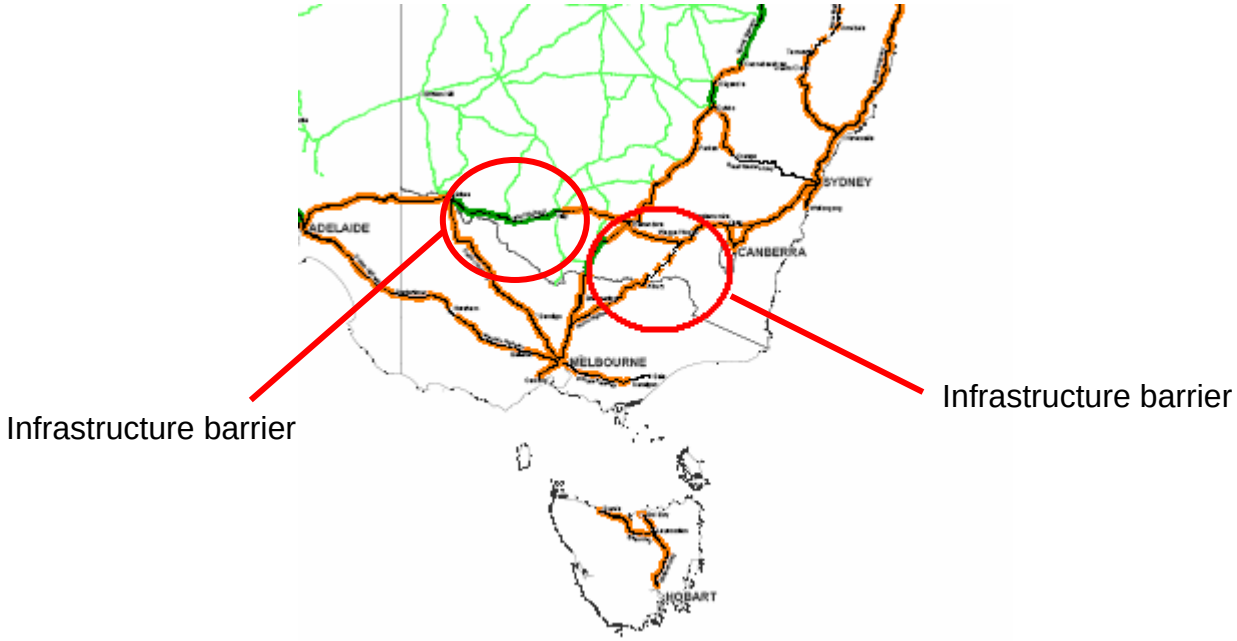

Figure 2. Section of the proposed B-triple network

[7] This may mean that the vehicle may have to decouple a trailer and operate as a B-double along this section.

2.4.3 Cost reflectivity

The focus on heavy vehicle charges is often on those vehicles that challenge the prescribed limits and which travel high annual kilometres. The concern is that those vehicles currently do not pay their allocated cost and may not even cover their attributable cost. These vehicles operate above the average in terms of usage. As the proportion of those vehicles increase, asset owners are concerned that they will not recover sufficient revenues to address the damage caused by those vehicles. In that respect, cost reflectivity is important for asset owners.

However, not all freight is the same. There are a larger number of operators currently hitting volume limits before they hit mass limits. A move towards a more direct form of pricing will ensure that those vehicles are not be charged for damage that they do not incur. Similarly those vehicles that do not operate 12 months of the year (mostly agricultural vehicles) and therefore operate relatively short distances will not be subject to registration charges which assume they travel average annual distances. This will be important for those vehicles travelling on rural and regional roads which are expected to face higher direct prices than major roads. With averaging largely removed, vehicles that travel on these roads will not necessarily face a price increase, particularly if they are more volume constrained than mass constrained. Those who do have mass constraints may be charged more for their "base" amount, but also have the potential to access higher mass limits increasing their benefit.

2.4.4 Incentives for private sector solutions

Road services for heavy vehicles are generally thought of as being provided by the public sector. However, direct prices provide clear signals and revenues streams for the private sector to offer investment solutions. Ultimately direct pricing for heavy vehicles may make possible greater private sector involvement in the addressing of infrastructure blockages. This can be achieved if the private sector believes there is sufficient demand as reflected through charges and could apply to upgrades of roads or bridges. There are a number of ways in which the private sector could provide solutions, with some form of private public partnership being the most likely.

Private sector solutions have a dual benefit. Firstly it can reduce the burden of investment for road agencies which may wish to focus road service investment for general access. Similarly, it creates an incentive for productive and dynamic efficiency in order to reduce investment costs to obtain the revenue streams associated with the investment. This benefit is more able to be realised in the addressing of missing links.

3. PRICE STRUCTURE OPTIONS

Chapter 2 provided a case for price reform for heavy vehicle charges. It identified an objective of enabling operators to choose how they consume the network appreciating the costs of doing so and enabling asset owners to provide a network that would enable this choice.

The current charging regime does not allow for this objective to be met. It treats vehicle usage (within a class) as uniform and does not distinguish by cost the use of various parts of the network. Operators are therefore not able to fully appreciate the cost they incur on various parts of the network, nor are they able to determine whether it is efficient for them to consume in the manner which they currently do given the benefit they derive from doing so. Further, they are unable to signal whether they would value additional expenditure on certain parts of the network by being prepared to pay higher charges associated with that expenditure. The rigidity of the current approach means that it is only effective in recovering aggregate cost recovery and even then the constraints on the model have meant that heavy vehicles have over recovered PAYGO expenditure.

If we accept that the current charges model cannot deliver an objective of choice, the question is what will?

3.1 A potential end model

Prior to the commencement of the Productivity Commission Inquiry, the NTC undertook a scoping study to consider what might be an appropriate direct pricing model for heavy vehicles. The objective was to develop a model which might achieve the type of benefits described in chapter 2.

Whilst an exact model was difficult to develop in the absence of key policy decisions being made, the broad features of a potential end model were identified. Whilst the NTC did attempt to undertake a cost benefit analysis of this end model, the lack of detail behind such a model made quantification difficult. Therefore, the study also identified potential stepping stones on the road to achieving the ultimate end model, with the expectation that a cost benefit would be undertaken at each step of implementation to determine whether the next step was justified.

Before discussing the stepping stones, it is helpful to discuss the features which would form the ultimate model. These are discussed below.

3.1.1 The costing methodology

Although the discussion draft endorsed the PAYGO methodology, the NTC believes that it is useful to consider alternative approaches and how they may facilitate a direct pricing regime.

There are three main options which could be adopted for a costing methodology to meet the objectives discussed in Chapter 2. These options were the subject of NTC's supplementary submission to the Inquiry's Issues Paper, "Alternatives to PAYGO". These options are:

- PAYGO;
- an Enhanced PAYGO; and
- Whole of Lifecycle Costing.

Although ideally a whole of life cycle cost would be adopted, there are a number of constraints which potentially limits its ability to result in a material difference to other approaches. Each of these approaches will be briefly discussed.

PAYGO

The Discussion Draft endorsed the NTC's current PAYGO approach of cost estimation and its cost allocation model as a relatively efficient method of estimating road infrastructure costs. Although NTC welcomes this endorsement and agrees that given the current objective for heavy vehicle charges, this is the most appropriate method, it is still unclear whether this will continue to be the case if objectives change and there is a movement towards direct pricing. By definition direct pricing will be required to be cost reflective of actual usage. Simply allocating PAYGO costs to a price structure other than broad vehicle class may not be adequately cost reflective and may ultimately fail to achieve the ultimate objective. This is primarily because the averaging inherent in the PAYGO approach means that very few vehicles pay their actual cost of using the network and the deviation away from this cost can be considerable. Therefore, whilst the concept of paying all costs in the year incurred may still be relevant, the way in which costs are allocated are likely to change to better reflect the drivers of cost.

An Enhanced PAYGO

An enhanced PAYGO approach would continue to recover the cost of use in the year incurred and continues to use historical expenditure as a proxy for future costs. However, the model is more refined to try to address some of the shortcomings of the current PAYGO model and better enables the application to direct pricing.

Essentially the enhanced model uses a more refined and cost reflective road classification, reduces short term lumpiness in expenditure by averaging data over a longer time period and incorporates an ex-post efficiency review.

In considering this, NTC commissioned preliminary work on road classification for cost allocation purposes. This work formed a further supplementary submission to the Inquiry's Issues Paper. The study identified the different parameters by which roads could be classified. These included topography and climate, road construction type, function and the existing urban/rural distinction. Whilst changing the road classification approach from the relatively broad rural/urban arterial/local road matrix to something more refined is likely to be complicated, it may still be able to be undertaken under a PAYGO type model.

Whilst efficiency of investment will still be an issue, the NTC has also begun to consider how efficiency could be reviewed as part of the costing methodology. It is likely that the traditional building blocks approach to expenditure review will be excessively costly. However, other approaches that are not as commonly applied in network based sectors may be able to be applied in the road sector. This includes using approaches such as partial productivity measures. The various approaches are discussed in more detail in Appendix B. NTC notes that the most appropriate form of efficiency review will be highly dependent on institutional arrangements and the ultimate price structure.

Whilst these are considerable improvements on the current approach, at this stage it is unclear as to the degree to which this would improve the current PAYGO approach and whether it would sufficiently allow for reduced asset life as a result of enhanced access. However, NTC believes that ultimately some element of forward looking pricing will be required to address this. This enhanced PAYGO approach may be a good first step towards this.

Whole of lifecycle costing

A whole of life cycle approach takes a holistic look at cost of infrastructure provision and seeks to recover the full life cost of providing the asset (including capital and maintenance costs). The approach is a forward looking approach to cost recovery and is akin to the more traditional approach of estimating a revenue requirement used in the regulation of other network based industries.

The benefit of a whole of lifecycle approach is that only efficient infrastructure provision is taken into account in the recovery of costs associated with that particular asset[8]. Whilst this does not prevent inefficient investment taking place, it does better ensure that road users do not pay for those investments. This provides a strong incentive for asset owners to undertake efficient expenditure and also helps to ensure that community service obligations are made more transparent.

The adoption of such an approach makes the calculation of increased damage caused by enhanced access more accurate. Enhanced access results in the reduction of the life of an asset. As a result, greater expenditure will be required to maintain the asset over it's original life. A forward approach would apportion the cost of this increased expenditure across those vehicles who cause the additional damage.

Further, a forward approach more fairly enables the recovery of cost of an upgraded asset. For example, if a bridge is upgraded to enable heavier vehicles to access it in a relatively unrestricted manner, the cost of the expenditure is able to be recovered over time reflecting the fact that the benefit of the upgrade extends beyond the year the cost is incurred. This assumes that the cost of an upgrade is over and above average capital expenditure and it is therefore less appropriate to recover it under a PAYGO methodology.[9]

One of the major constraints in the implementation of this approach is the cost of doing so. To calculate the future cost of an existing asset requires significant data in relation to asset condition. Furthermore, the regulatory burden on asset owners is likely to increase as they are likely to be more accountable for the expenditure decisions they make. This is likely to be a high cost for the smaller local governments that own and manage road assets.

Ultimately, it is uncertain whether the improvements in cost estimation warrant such an approach.

The appropriate approach to costing

The modelling work undertaken to compare these approaches was inconclusive. This was primarily because the available data was insufficient to differentiate between efficient and inefficient expenditure. The appropriateness of adopting a method outside of traditional PAYGO is dependent on the extent to which each approach results in a material improvement in particularly allocative efficiency. Although more work needs to be undertaken in this area to determine the most appropriate costing methodology it is highly unlikely that the current approach to PAYGO will be sufficiently flexible to be able to be applied to a direct pricing regime. As stated above, NTC would expect that whole of lifecycle costing would need to be adopted for at least some classes of expenditure but at

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[8] It should be noted, however, that if the original asset was not an efficient investment, a whole of lifecycle approach without an efficiency review will not necessarily result in efficient cost recovery.

[9] One of the assumptions of PAYGO is that the sector is relatively mature and expenditure is in a steady state. Therefore, it does not matter if the full capital cost of infrastructure is recovered in the year it is incurred because every year would on average incur the same capital cost.

the very least it is expected an enhanced PAYGO approach would be adopted. Combining the two costing approaches may be possible if the assets they are applied to are consistently treated separately.

3.1.2 The structure of charges

Although a definitive structure of charges is unable to be determined in the absence of further cost information and policy decisions, a direct pricing regime is likely to consist of a set of variable charges based on some combination of distance/location, vehicle characteristics (such as a measure of mass and axle configuration) and time of day. The variable charge would seek to recover the long run marginal cost based on future efficient infrastructure needs. The charges could include any externality cost not already internalised. It would be fully cost reflective of individual usage as opposed to average usage. A nominal registration charge would reflect any residual costs not recovered through the variable charge as well as administration fees.

This approach is consistent with approach 1 discussed in the Discussion Draft where

"Charges could be set to reflect marginal costs of using particular roads or road types with an access fee reflecting a contribution to network-wide capital costs" (p 8.27, PC 2006)

Under this type of charges regime, access to the network would be constrained only due to safety and community considerations. Over time, pricing signals should focus infrastructure investment so that bottlenecks for an efficient level of operations are removed. The regime would apply to all vehicles and would ultimately adopt some form of in-vehicle technology for both charging and compliance purposes.

3.1.3 The institutional framework

The scoping study undertaken by the NTC did not consider in any detail what the ideal institutional arrangements would be under a direct pricing regime. It did identify that the full benefits of a new pricing regime were more likely to be realised in an environment where pricing revenue was linked to expenditure and that pricing signals were able to be given and received between asset owners and road operators.

The Productivity Commission has emphasised the importance of the institutional framework supporting the pricing regime. It has supported the view expressed in most submissions received that reform of the institutional framework will enable the delivery of a large share of the benefits of price reform. Under a direct pricing arrangement there are a number of options which could be implemented. The preferred model will be dependent on the resolution of a number of issues. These include:

- who will set the prices?
- who will collect revenues?
- how will revenues be allocated?
- how will road revenues be spent?

Responsibility for setting prices

There are two main approaches which could be adopted. The first is that a central body would collate cost information and determine prices. This is consistent with a typical

monopoly based form of relatively heavy handed economic regulation. The main benefit of this approach is that it ensures consistent national pricing which is particularly important with an interoperable network. It would also generally mean that price reviews would be undertaken in a more predictable and transparent fashion with greater accountability and consultation. This approach also more easily facilitates consideration of broader pricing overlays such as community service obligations and Auslink.

The alternative approach is for each asset owner to have responsibility for setting prices for its own network. This is consistent with a more light handed regulatory approach. There are a number of ways in which this could be implemented, but the most simple would be for a central body to provide price setting guidelines and for resulting prices to be "approved" or audited by that body.

The NTC notes that the commercialisation model which the Discussion Draft outlines could adopt either of these models. The extent of the regulatory burden (i.e. a heavy handed or light handed approach) would depend on the extent to which it is believed the asset owner could exert monopoly power.

In deciding who should set prices the following should be considered:

- monopoly power;
- consistency in prices;
- transparency;
- perverse pricing signals and distortions;
- strategic expenditure; and
- community service obligations.

Collection of revenues

The simplest approach would probably be the establishment of some sort of central revenue collection body. This agency would collect usage data (either directly or through a third party service provider of in-vehicle technology), advise operators of their specific charge and be the recipient of payment. The agency would then allocate revenues to asset owners as according to usage. In order to ensure pricing signals flowed, the revenue collection body would also provide usage information to the asset owner.

An alternative option is for road agencies to directly collect revenues. This could be done through obtaining usage information from third party service provider of in-vehicle technology. However, it is likely to result in a considerable burden for road operators that operate multi-jurisdictionally.

The NTC notes that if a central collection body is the preferred option, it is important that demand signals adequately flow through to asset owners so that market based investment decisions can be made.

Things to consider include:

- transparency of process;
- administrative cost and burden;
- privacy laws;

- public acceptability; and
- private sector willingness.

Allocation of revenues

Direct pricing can provide two types of pricing signals – for usage and for investment. However, the ability of prices combined with usage to provide effective signals for investment are highly dependent on how revenues are allocated – without adequate funds, road agencies may not undertake required investment.

The Productivity Commission has recommended that a Road Fund be considered to "facilitate more efficient decision-making, funding and provision of road infrastructure". (PC 2006 p 9.28). It has described the fund as "essentially a 'banker' in allocating funds for road outputs" (PC 2006, p 9.21). The NTC is not in a position to discuss the specifics of a road fund model, however it does make a number of observations.

First, the supporting institutional arrangements should support the same objective as the pricing regime. NTC notes that road funds have been established in a number of countries for various reasons. For example, NTC notes that the model developed in New Zealand has been to support a broad land transportation objective, as opposed to a specific objective to facilitate heavy vehicle movement, which is more commercial in nature. This contrasts with road fund models adopted in developing countries which are often set up to support donor contributions in an often corrupt environment.

Whilst these differing objectives do not mean that it is necessarily inappropriate to adopt a road fund model in Australia, it must be clear how such a model would support a *heavy vehicle* pricing objective, particularly when heavy vehicles constitute such a small proportion of the total road fleet. In this regard, efficient *heavy vehicle* infrastructure provision may not necessarily be provided for by a road fund. It is also unclear how market driven projects which heavy vehicles are prepared to pay for (such as the upgrading of a bridge) will be facilitated through the fund (i.e how will the road fund respond to market signals as opposed to asset owner bids?). NTC's concern is that filtering revenues through a road fund would result in a dampened price signal for asset owners.

The NTC does acknowledge that a complicating issue relates to how road revenues are split between light and heavy vehicle expenditure. The partial nature of pricing for heavy vehicles and the mixed use of the network means it may be difficult to allocate revenues purely to heavy vehicle expenditure. However, there is a direct relationship with enhanced heavy vehicle access and infrastructure rehabilitation and maintenance/renewals. In this respect, allocating heavy vehicle direct revenues directly back to asset owners should simply support early intervention or heavy vehicle related infrastructure upgrades.

There are a number of issues which need to be resolved in relation to this area:

- should local government be a direct recipient of pricing revenue or would the frameworks required to support this be too much of a burden? If they are to be excluded from receiving direct funding, how should revenues to allocated to local government?
- should local government continue to provide local roads?
- how should revenues be split between state and federal governments?

- should states continue to receive a "fixed" proportion or should allocation reflect usage?
- should Federal government continue to receive pricing revenue?

Regulatory framework

The design of the economic regulatory framework would be dependent on the policy decision made on the price structure and institutional arrangements. Depending on the degree of economic regulation required, the regulator may or may not be combined with a technical (safety) regulator. Ultimately it would be expected that an independent economic regulator would be required to either set prices on the basis of an agreed road classification or to provide guidelines and approve prices set by asset owners.

If responsible for setting prices, price reviews would occur periodically (e.g. every 5 years). This would ensure that there was certainty of prices for operators and revenues for asset owners for them to make medium term investment decisions. It would be envisaged that after a period of settlement, prices would become relatively stable. The regulator would have determinative powers, although would be subject to standard regulatory accountability processes such as appeal mechanisms and public audits.

3.2 Implementation stages

The model described above would be expected to deliver the benefit outlines in chapter 2. Through a direct pricing regime, road operators would be able to make informed choices about how they wish to consume the network, and would be given the ability to purchase additional rights should they meet safety and community concerns and believe there is sufficient benefit in doing so. Further, those who consume the network at less than the average would not pay access prices which assume they do. Asset owners would have clear signals about how vehicles wish to consume the network and would then be able to make informed investment decisions about how to best provide the network that is required. More importantly however, is that asset owners would feel relatively indifferent to granting additional access (subject to satisfaction of safety concerns) to more productive vehicles. This is expected to have considerable benefits beyond the transport sector and the distribution of goods becomes easier and more cost effective.

However, whilst this ultimate model may deliver these benefits, it is likely to only do so at a fairly high cost. There is a considerable degree of risk that the cost may outweigh the benefits. This is especially in relation to the adoption of technology for pricing purposes. Therefore, the scoping study recommended that it would be prudent to take a phased approach to price reform to mitigate the risk. The way in which such an approach can reduce risk are by:

- preparation of a business case detailing the process and governance for development of a new pricing regime;
- testing demand giving confidence that reform will result in benefits;
- testing policy decisions;
- releasing early productivity gains; and
- creating review points to test whether the marginal benefits of the next stage of reform outweigh the marginal costs.

NTC has identified a number of potential implementation stages which are based on consultation NTC has undertaken with stakeholders through its scoping study and on what is practically implementable. Whilst the benefits on offer can only be fully realised with complementary institutional arrangements, the scoping study itself did not address what institutional reform might be required. However it should be noted that in addressing the heavy vehicle problem the end model described above may not require *all* road revenues (i.e. light and heavy vehicle charges revenue) to flow directly to asset managers. The mixed nature of road use and investment means that there would be little benefit for road agencies to only receive heavy vehicle pricing revenue in making holistic network investment decisions. However, it *may* be sufficient for only the revenues associated with enhanced access to flow directly to asset owners. Alternatively, it may be possible for road agencies to adopt a form of shadow tolling of light vehicles to assist in making holistic efficient investment decisions. In any case, in any environment where there is direct pricing it will be important to ensure only efficient costs are passed through to operators.

The potential implementation stages are discussed below. It should be noted that the achievement of each stage the benefits and costs of the next stage would need to be assessed to determine if it is worthwhile continuing to move forward.

3.2.1 Stage 1: An incremental pricing pilot

Prior to a new determination taking place under a new set of principles, a considerable number of policy decisions will need to made. In the interim, with the introduction of Performance Based Standards, there is expected to be increased interest in a form of incremental pricing.

Incremental pricing enables enhanced access outside of the prescribed environment. It facilitates vehicles which wish to carry additional mass on the network (whether it be in addition to the defined mass limits of the vehicle or of the road). Incremental pricing are believed to be the first pricing mechanism which will allow a step shift in freight productivity.

Whilst conceptually incremental pricing is appealing and apparently simple, the calculation of the prices themselves are somewhat more complex. Again this is primarily due to a number of policy decisions having not yet be made (such as on what basis should incremental charges be applied, e.g. mass or equivalent standard axle?), the lack of supporting data on incremental costs and the lack of an adequate institutional arrangement to support the prices.

However, it is expected that in the relative short term, these issues could be sufficiently addressed to enable a trial of incremental pricing prior to the finalisation of the feasibility study. This could form stage 1 of price reform implementation.

In this stage incremental prices would be added to the charges structure of registration and fuel charges for those who wish to operate outside of the prescribed limits within a defined network. It is expected that the prices would be calculated centrally but in consultation with asset owners. Prices would not be set for individual roads but would be based on an agreed road classification system. It is likely that for this stage, the defined network will be a geographical area where certain asset owners have agreed to participate in the trial. Access would be granted subject to PBS safety standards being met.

The prices themselves could be administratively collected through the PBS institutional arrangements, thereby requiring only minimal changes to pricing institutional arrangements. Once the PBS panel has approved a vehicle for access to the network, a

price would be automatically generated on declared mass on either the entire defined network or on specific routes. As with PBS, the approach assumes "mutual recognition", where acceptance under PBS will ensure access to a predetermined network. Individual jurisdictions would need to identify their respective assets which could sustain the additional damage caused by enhanced access and could also identify the "missing links" they would be prepared to apply incremental prices to and receive revenues for. Whilst technology would not be used to calculate prices or invoices, compliance will need to be monitored. It is expected that IAP would be the initial monitoring tool as it is expected to support PBS.

Revenues collected from the regime are expected to flow back to the relevant asset owners. There will be a need to resolve the issue of revenue distribution of vehicles wishing to operate multi-jurisdictionally however this can be resolved on a trial basis using usage data.

The trial of incremental pricing would be a good testing ground for changing attitudes from charges to prices. In doing so it will test whether there is a demand for direct pricing by road users and whether asset owners respond to pricing signals and invest particularly in the missing gaps.

3.2.2 Stage 2: Fully applied incremental prices and an improved cost base

The work commenced as part of stage one will continue in the development of stage 2. Stage 2 consists of a more complete incremental pricing regime and an improvement to the cost base to ensure a better alignment between costs incurred and revenues received from the combination of charges. It would be a full price review.

Base charges will still be based on a two part tariff of a fixed registration charge and a variable fuel charge. However, there may be some scope for refinement of the split between the two sets of charges to better reflect long run marginal costs and residual fixed costs. This will largely be dependent on institutional arrangements.

Considerable improvements may be made to the cost base, which is expected to adopted an enhanced PAYGO approach. As described in Chapter 2, this will include averaging of expenditure data over a greater period, the refinement of road classifications and cost allocations and the adoption of a form of efficiency review.

It is expected that enhanced PAYGO will enable the improved cost allocation of attributable and common costs so that vehicle classes better reflect actual costs for that group. The approach will still include averaging and therefore if used within a vehicle class is still diverse there will still be cross subsidisation within a class. However, if , for example, B-doubles do operate mainly on interstate routes, the overall cost allocation for B-doubles may go down. The idea is to try to get the base more "right" than it currently is.

This approach assumes that PAYGO is an acceptable proxy for future costs, as was found by the Productivity Commission in its Discussion Draft. It should be noted that should there be changes to institutional arrangements, it is expected that PAYGO will be more reflective of future expenditure, as road managers will be able to plan with more certainty over funding. However, as with other natural monopolies, this will not necessarily result in *efficient* expenditure. As such, it is expected that this stage of reform will trial some form of an efficiency review of PAYGO expenditure.

It should also be noted that if a commercial institutional framework is established, it may be necessary to adopt a rate of return to reward for higher levels of risk.

It is expected that this stage for implementation would enable a more broadly applied and more refined incremental pricing regime. The defined network would expect to be broadened and guidelines could be provided as the basis for negotiations for those wishing to operate outside of the defined network. As part of this stage it may be possible to move away from an administrative approach to pricing to a technology based approach.

3.2.3 Stage 3: Partial application of direct prices

One of the recurring comments expressed as part of the consultation process during the scoping study was the view that the problems associated with the current charges apply primarily to the heavier vehicles in the fleet and particularly along certain routes. Therefore, stage 3 of implementation would look to introduce a complete form of direct pricing, but restricting application to certain vehicle classes or routes.

The direct pricing regime would reflect the characteristics described in the endgame model. As such it would integrate incremental pricing.

There are a number of issues which would need to be resolved in moving towards this regime. The key issue will be reconciling the two regimes (i.e. direct pricing and the traditional two part tariff) so that price signals are received by both operators and asset managers whilst ensuring that double counting does not occur and that total costs are still recovered.

3.2.4 Stage 4: Applying direct prices to the whole heavy vehicle fleet

Should a cost benefit analysis support it, the next stage of reform could be implemented. Stage 4 would be full implementation of direct pricing. The major benefit of this stage applies to those who currently operate below the average in terms of mass and distance. In the full application of direct pricing, those who are currently overpaying for road services will not continue to do so. Asset owners will also be able to determine not only when an asset requires upgrading, but also when it can be downgraded for heavy vehicle purposes.

3.3 Challenges

There are considerable challenges to the reform of heavy vehicle pricing which results in considerable risk in moving forward. The phased approach to implementation is intended to mitigate these risks to some extent. However, it is important to identify the risks and establish a clear strategy for dealing with each one.

The remainder of this chapter identifies the major challenges facing reform and considers how they may be approached.

3.3.1 Institutional arrangements

History of reform in other sectors would suggest that institutional arrangements are likely to present the greatest challenge to the success of a new pricing framework. This is due to a number of reasons including the fact that the current charging arrangements provide a stream of taxation revenue to both the state and federal governments and that there are multiple providers of road infrastructure at various political levels and subject to different public pressures. It will also be difficult to align heavy vehicle revenues with heavy vehicle investment given road investment is rarely based on heavy vehicles alone.

The Discussion Draft suggests that a road fund may provide a suitable framework to support a new heavy vehicle charges regimes. Section 3.1.3 discussed this in some detail

and identified the issues which would need to be addressed in the establishment of an institutional framework.

In particular, the resolution of the constraints surrounding local governments will need to be addressed. There are around 700 local governments involved in the provision of road infrastructure services. Whilst these services are predominantly provided for light vehicles, local roads are often seen as a bottle neck for heavy vehicles. Therefore, the inclusion of local roads and the owners/managers of those assets will be important in releasing the full benefits of price reform. The key issues to face local governments are:

- constitutional constraints in relation to charging (as opposed to pricing);
- human and financial resource constraints;
- data provision;
- the specification and funding of community service obligations; and
- financial accountability burden.

Going forward it will be important to take a systematic approach in the development of appropriate arrangements. NTC would support the development of a feasibility study on various institutional models to support heavy vehicle price reform. Whilst this would clearly have a strong relationship with reform of the pricing regime, it may be more appropriate for this to be run as a separate but parallel process under the same governance arrangements.

3.3.2 Efficiency

Efficiency has been discussed in considerable detail in the Discussion Draft and in NTC's submission. The Discussion Draft identified that efficiency is a principle for heavy vehicle charges. This submission argues that heavy vehicle charges can influence efficiency not only in infrastructure provision but also in heavy vehicle utilisation of the infrastructure.

The Discussion Draft suggests that institutional reform will assist in better achieving efficient infrastructure outcomes. The NTC agrees that changes to the current institutional arrangements are likely to result in expenditure better reflecting a more appropriate investment program. However, NTC notes that cost benefit analysis which typically underpins a road service providers investment program provides a justification for investment. However, in itself it does not necessarily result in efficient investment. This is because a cost benefit analysis does not assess the productive efficiency of costs, nor does it necessarily sufficiently consider allocative efficiency through consideration of alternatives.

As the Discussion Draft outlines, these inefficiencies result from the fact the road sector is effectively a natural monopoly which faces limited competition.

The NTC has commissioned a study to better consider how efficiency reviews may be undertaken as part of a price review process (see Appendix B). The study found that assessing efficiency using the traditional mechanisms may be difficult. In particular, applying a bottom up approach which reviews expenditure programs in detail is likely to be a time consuming and costly task which may not result in consistent assessments of efficiency across all 700+ asset managers. The initial view is that it may be more appropriate to take a top down approach where like asset owners are benchmarked against each other.

3.3.3 Road wear relationships

Since the early 1990's the former NRTC and now NTC has commissioned significant research into investigating the relationship between heavy vehicle road use and expenditure on the road network. This research has been used to determine cost allocation relationships that relate heavy vehicle road use to different types of road expenditure. These cost allocation relationships which look at the impacts of heavy vehicles on the road network are critical in determining heavy vehicle charges.

The need to improve certainty and accuracy in cost allocation for heavy vehicles is an ongoing task due to changes in the heavy vehicle fleet over time due to changes in travel patterns, load levels and vehicle types and changes in both the level and types of road expenditure.

The NTC has identified a need to improve confidence and accuracy in a number of key areas of cost allocation for heavy vehicles and these include, cost allocation by road type, pavement maintenance, load impacts using Equivalent Standard Axle (ESA) predictive formula, heavy vehicle impacts on bridges and earthwork requirements, estimates of heavy vehicle use of local roads and local road expenditure estimates by type of road expenditure.

The cost allocation system currently has its cost allocation rules based on a single road type namely sealed arterial roads. The approach was derived as an average appropriate across all sealed arterial roads, and is applied across the entire road network. It therefore assumes that all roads are characterized by the same cost function. However, this is not likely to reflect reality. It is known that different pavement constructions perform in different ways, with different failure mechanisms applying to different types of roads. Therefore the need to be able to undertake cost allocation by road type would be an important improvement.

Since the national heavy vehicle charging system was first developed, four separate attempts have been made to establish a reliable statistical relationship between road use and pavement maintenance expenditure. Only one of these attempts has provided any statistical confidence due to the lack of a reliable and sufficiently detailed national pavement maintenance database. There is a need to establish a suitable pavement maintenance database to more confidently link heavy vehicle use and pavement maintenance impacts.

Amongst the other research identified there is also a need to establish better ESA data for the full range of heavy vehicle types, update knowledge on relationships between heavy vehicle road use and bridge and earthworks expenditure which have not been reviewed since the early 1990s, undertake further surveys of heavy vehicle use of local roads and improve the reporting and classifying of local road expenditure data.

A number of research projects which will generally take two to three years to complete have been initiated by the NTC covering most of these areas, with Austroads and the NTC jointly funding a number of these projects. These projects are essential to support both improvements to the current cost allocation and heavy vehicle charging systems and will provide important data for any future moves to more direct road pricing.

3.3.4 Adverse impacts

One of the major challenges to heavy vehicle price reform is impact the regime is likely to have on vulnerable customers. The current approach to pricing includes considerable cross

subsidies (as shown in Figure 3) which smoothes out to a large degree price differentials between different jurisdictions.

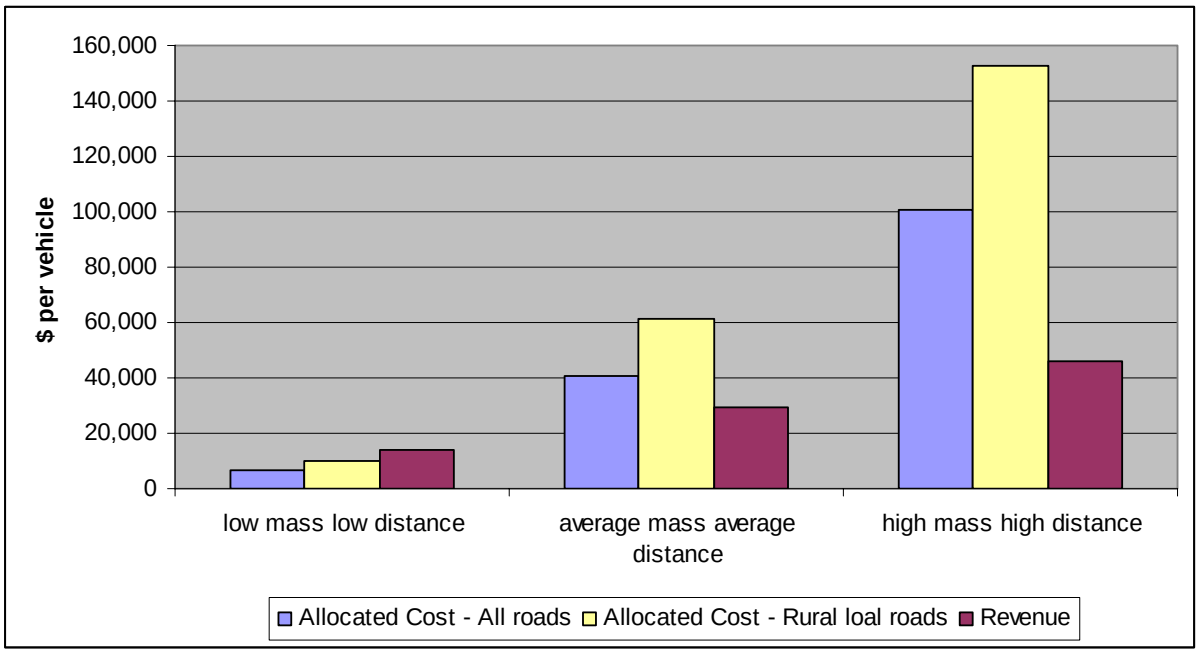

Figure 3. Cross subsidies within the current costing approach

However, with the introduction of more cost reflective pricing, in the first instance this smoothing effect is likely to be considerably reduced. This is demonstrated in DOTARS submission to the Productivity Commission's Issues Paper which highlighted the difference in marginal costs between selected corridors.

Table 1. BTC (1999) marginal road wear cost estimates – selected corridors

Corridor	*Marginal cost (cents per ESA-km)*[a,b]	*Marginal cost, six-axle articulated truck (cents per km)*[a,b]
Sydney–Melbourne	1.2	2.4
Sydney–Brisbane	2.1	4.2
Sydney–Canberra	1.5	3.0
Melbourne–Adelaide	1.5	3.0
Adelaide–Perth	4.2	8.4
Toowoomba–NT border	16.4	32.7
Perth–NT border	13.3	26.7

a. Estimates at 1997–98 prices.

b. The marginal costs estimates for a six-axle articulated truck assume an average of 2.0 ESA per vehicle, which was based on NRTC (1998).

Sources BTE (1999, p. 56), NRTC (1998) and BTRE estimates.

The difference between the marginal costs of major roads and local roads and rural and regional roads are further demonstrated in Table 2.

Table 2. Comparison of avoidable cost estimates

Study	*Method*	*Road network*	*Year*	*Avoidable cost*	*Avoidable cost (at 2000-01 prices)*
				(cents / ESA-km)	
BTCE (1988)	PAYGO cost allocation	All roads	1986–87	14.6	24.3
	"	Arterial roads	1986–87	8.8	14.6
	"	Local roads	1986–87	64.9	107.9
Webber, Both & Ker (1978)	Life-cycle model	Arterial roads	1974–75	3.21[b]	15.5
RoRVL study (NAASRA 1984)	NIMPAC (life-cycle) model	Rural and outer urban arterials	1984–85	4–7	7.8-13.6
US FHA (1982)	PAYGO cost allocation	Rural interstate	1981	US 9c	20.4
	"	Rural arterial	"	US 21c	47.5
	"	Rural collector	"	US 28c	63.3
	"	Rural local	"	US 50c	113.1
BTE (1999)	PAYGO cost allocation	Arterial roads	1997–98	3.2	3.5
	Life-cycle model	NHS (1992)	1997–98	1.75	1.9
BTRE estimates	PAYGO cost allocation	NHS (2001)	2000–01	2.5	2.5

a. All values updated to 2000–01 prices using movements in the CPI.

b. Value for six-axle articulated trucks.

Sources BTCE (1988), BTE (1999) and BTRE estimates.

These figures reflect the fact that regional roads cover a large distance, service a greater proportion of heavy vehicles compared to light vehicles (and therefore have a greater share of the total cost allocated to heavy vehicles) and that few vehicles in total use these roads compared to major roads. There are likely to be urban areas which are also affected, however it is unlikely to be to the same extent.

The Discussion Draft notes that Ramsey Pricing can be used to allocate common costs, however the lack of elasticities (price sensitivity) for the road sector would make it difficult to adopt such a regime. In any case, it is not clear that operators on rural and regional roads are any more inelastic than those operating on major roads. Indeed, they may be more inelastic as they do not have an alternative mode of transport (i.e. rail, air or sea).

The NTC has considered how adverse impact of vulnerable communities may be able to be addressed through community service obligations in its Rural and Regional Impacts submission to the Inquiry Issues Paper. The paper identified three options in adopting community service obligations:

- through adjustment through the cost base;
- through adjustment to prices; and/or
- through rebates.

Each approach has the potential to lead to distortions and it is therefore crucial that a clear social policy is articulated to guide the application of community service obligations. This is consistent with the Discussion Draft recommendation of greater transparency of funding of community service obligations (draft recommendation 11.1, PC 2006).

There will be a number of issues which will need to be resolved through addressing this issue including:

- who can set community service obligations;
- how community service obligations are funded;
- the value that should be given to community service obligations; and
- the best approach to implement a community service obligation

3.3.5 Technology development

New and emerging technologies have opened up a range of possibilities for pricing heavy vehicles more directly for their use of the road. However, with these technologies come challenges that will need to be actively managed in the development of a direct road pricing scheme. These challenges include the accuracy and evidentiary standard of the data collected, costs associated with technical solutions and the timeframe for development.

Accuracy, Reliability & Evidentiary Standard of Data

Technology is currently available that could potentially support a mass-distance-location based pricing regime. The Intelligent Access Program (IAP), to be introduced in 2007, will use on-board technology and a comprehensive digital map to monitor vehicle location for compliance purposes on the majority of the Australian road network. Initial discussions with Transport Certification Australia (TCA) have indicated that this technology is also capable of recording distance travelled by vehicles through the use of 'virtual' gantry points on the road map. In addition, technology is currently being trialled in Queensland that may allow for the on-board measurement of mass.

The challenge associated with using this technology in a heavy vehicle pricing regime is the degree of accuracy and the evidentiary standard of data required for pricing purposes. To be used to calculate road use prices, data recorded on location, distance and mass is expected to need to have an accuracy of at least 99% and the technology used to collect it will need to be tamper-evident.

In terms of location and distance travelled, the adequacy of the current technology in meeting these pricing requirements will be largely dependent on the policy decisions associated with the classification of roads and how distance is to be measured for pricing.

However, these requirements are of particular concern for on-board mass measurement, where tests indicate that the available technology is not fit for pricing purposes. While the private sector has indicated that current technology can be modified to meet pricing purposes, and that this will happen as markets for the technology begin to emerge, it is unlikely this technology will be tested and commercially available before 2010.

Costs

The costs of a technical solution will be largely dependently on the functional requirements of the pricing scheme. It is reasonable to conclude that the more complex the pricing

requirements and disaggregation of data required, the higher the level of costs associated with the technology.

A particular case in point is the measurement of mass. The technology costs associated with a charging scheme based on the actual weight of a vehicle during its journey will be considerable higher than a scheme based on maximum permissible weight. These costs will need to be assessed in terms of the productivity benefits they release.

The costs associated with technology, however, can be managed by establishing clear principles on cost in the initial stages of designing of a technical solution. Due to budget constraints, it is inevitable that trade-offs will need to be made in developing a technical solution and guiding principles provide a framework against which options can be assessed.

Timeframe

One of the key factors impacting on the design and development a technical solution to support a pricing regime will be the timeframe in which the scheme is to be introduced. A relatively short time frame will constrain choices to proven technologies currently available on the market. Where these are not fit for pricing purposes, administrative options will need to be considered as an alternative.

3.3.6 Operations costs

There will be ongoing operational costs associated with a direct pricing scheme. The level of these costs will be dependent on the overall design of the system and will be affected in particular by compliance and enforcement mechanisms, and the systems required to process prices and payments.

For example, if the pricing scheme uses technology to accurately measure road use based on dynamic variables such as actual weight or distance travel on a particular road, then the compliance and enforcement mechanisms required to ensure operators are paying the correct prices will be more complex. Or if a particular technical solution requires prices to be calculated in a back-office environment then there will be significant on-going processing overheads and corresponding costs.

In choosing technology to support a heavy vehicle pricing scheme, it will be essential to consider the costs of each stage of the solution's life, including implementation, operation and maintenance. Choices will need to be made between higher implementation costs/lower ongoing operational costs or lower implementation costs/higher ongoing operation costs, and who will ultimately bear these costs. Again, it will be essential to establish guiding principles for designing a technical solution against which these choices can be assessed.

It will also be important to consider lower cost pricing solutions that are more administratively based and do not require road use to be measure accurately as the compliance mechanisms and processing systems associate with these solutions are likely to be simpler and have lower on-going costs.

3.3.7 Regulatory process

The current regulatory process for setting heavy vehicle charges is a political one. It creates considerable uncertainty in relation to funding streams for road agencies and is not consistent with regulatory best practice.

The more standard approach is to have an economic regulator charged with setting prices. The regulator would have determinative powers. However, any pricing decision would be subject to appeal by operators or the asset owner. Appeal is typically made to a Competition Commission which sets up a tribunal to make a finding within a strict process.

An alternative approach might be to enable asset owners to set their own prices following set guidelines (to ensure consistency) with operators able to appeal to the "regulator". This can reduce the regulatory burden (although if there are constant appeals it is ineffective) but does introduce additional complexity where price signals intended to meet the productivity objective may not be clear. It may also be used by big operators (who might be prepared to pay a premium for access) to exclude smaller operators who may not be able to pay the premium and are inadequately represented to feel they can appeal.

In any case, in order for a new regime to be effective it will be important to remove political intervention as much as possible.

4. PROCESS FOR REFORM OF HEAVY VEHICLE PRICING

4.1 Governance arrangements

The governance arrangements for the reform process will be crucial. Therefore arrangements must be put in place prior to reform being undertaken. The current governance arrangements provide for the Australian Transport Council (consisting of transport ministers) to make final decisions in relation to national transport policy. Going forward, multiple arms of governments as well as non-transport government departments and the private sector will be involved in the reform process. Therefore it may be appropriate to establish a representative reform taskforce charged with overseeing the various elements of the reform process that is slightly broader than the ATC. Ideally the taskforce should have access to a dedicated fund to support the reform process. Because of the significant nature of the reform process and the fiscal implications for all levels of government, it may be appropriate for the taskforce to report to COAG.

The taskforce would be expected to co-ordinate at least three streams of work:

1. development of the pricing model;
2. development of institutional arrangements; and
3. technology development.

Whilst all three streams of work are related, they require the inputs and expertise of various parties. NTC, for example, is best placed to support the work stream that develops the pricing model. However, it may be less appropriate for NTC to take a lead role in the development of institutional reform or technology development. However, consistency between the various workstreams should not be compromised if a common governance structure is in place.

Although NTC considers all streams of work important, the remainder of this chapter will focus on the area it is best place to contribute towards – development of the pricing model.

4.2 Steps for heavy vehicle price reform process

This submission has focussed on providing a broad vision for price reform. However, in order to move toward that vision it will be important to establish a clear process which ensures a sound model is developed in a cost effective manner, whilst not constraining early productivity gains. This section outlines how this could be achieved and provides a realistic timetable for reform.

4.2.1 A new determination in 2007

Following the release of the Discussion Draft, NTC has been directed by the Australian Transport Council to undertake a new determination for heavy vehicle charges to be submitted to ATC for consideration by April 2007. This determination acknowledges that price reform will take time – perhaps more time than initially believed. However, in the interim it is important that the heavy vehicle fleet continues to pay their way. The objective of the 2007 heavy vehicle charges determination will be to ensure this is achieved.

4.2.2 Establishing productivity charges

Price reform is not a quick process. It will be important that policy decisions are fully considered and tested before continuing forward. Failure to do so could result in an outcome similar to that of the United Kingdom's Lorry Road User Charge.

However, in the interim there is increasing pressure to release early productivity benefits through the provision of charging solutions for highly productive vehicles such as B-Triples. These charging solutions differ from the incremental prices as they are for new classes or configuration of vehicles (as opposed to existing vehicles seeking additional mass).

NTC proposes to introduce short term charging solutions for these vehicles under existing pricing principles.

4.2.3 A business case for the feasibility of a new heavy vehicle pricing model

As discussed throughout this submission, there are considerable risks associated with price reform. It is therefore necessary that a clear plan is presented outlining the steps towards achieving the objective for heavy vehicle prices. Whilst it is expected the Productivity Commission's Final Report will form a conclusion as to whether price reform should be further considered, it is not expected to produce a detailed business case. In line with the Discussion Draft, NTC believes a comprehensive business case is essential for fully understanding the task.

The business case is essentially a fully costed project plan which defines the objective of the task, identifies the work streams required to meet the objectives as well as any associated assumptions and risks. It would consist of the following:

- background:
- objectives of a Heavy Vehicle Pricing Scheme and Investment Logic;
- project overview;
- conceptual solution;
- implementation roadmap;
- project briefs;
- cost/benefit analysis;
- project risks & proposed mitigation arrangements; and
- immediate next steps.

The business case lays the foundation for designing a new pricing regime. NTC notes that a business case should be produced for all three streams of work falling within the reform process.

4.3 Timeframes and deliverables

Table 3 gives a broad timetable for the reform of heavy vehicle charges to heavy vehicle pricing. The timetable allows for the completion and implementation of a new determination in 2007, the approval of a fully costed business case to develop a new

pricing structure and an indicative timetable for rolling out the new pricing model in a phased manner. Figure 4 provides the overview.

Table 3. Timetable for reform

Date	Action
Feb 2007	COAG meets and considers Productivity Commission Final Report. Informs Business Case.
April 2007	ATC meets and votes on the 2007 Heavy Vehicle Charges Determination
September 2007	**2007 Heavy Vehicle Charges Determination implemented**
October 2007	Business Case for Price Reform completed and submitted for approval
2007	Work commences on a new institutional framework
The following stages are dependent on development of the business case	
2010	**Stage 1 Reform** – Incremental pricing pilot (dependent on data collection and policy decisions)
2012	**Stage 2 Reform –** A new price review consisting of fully applied incremental prices and improved cost base
Post 2013	**Stage 3 & 4 Reform –** Partial and full application of direct prices

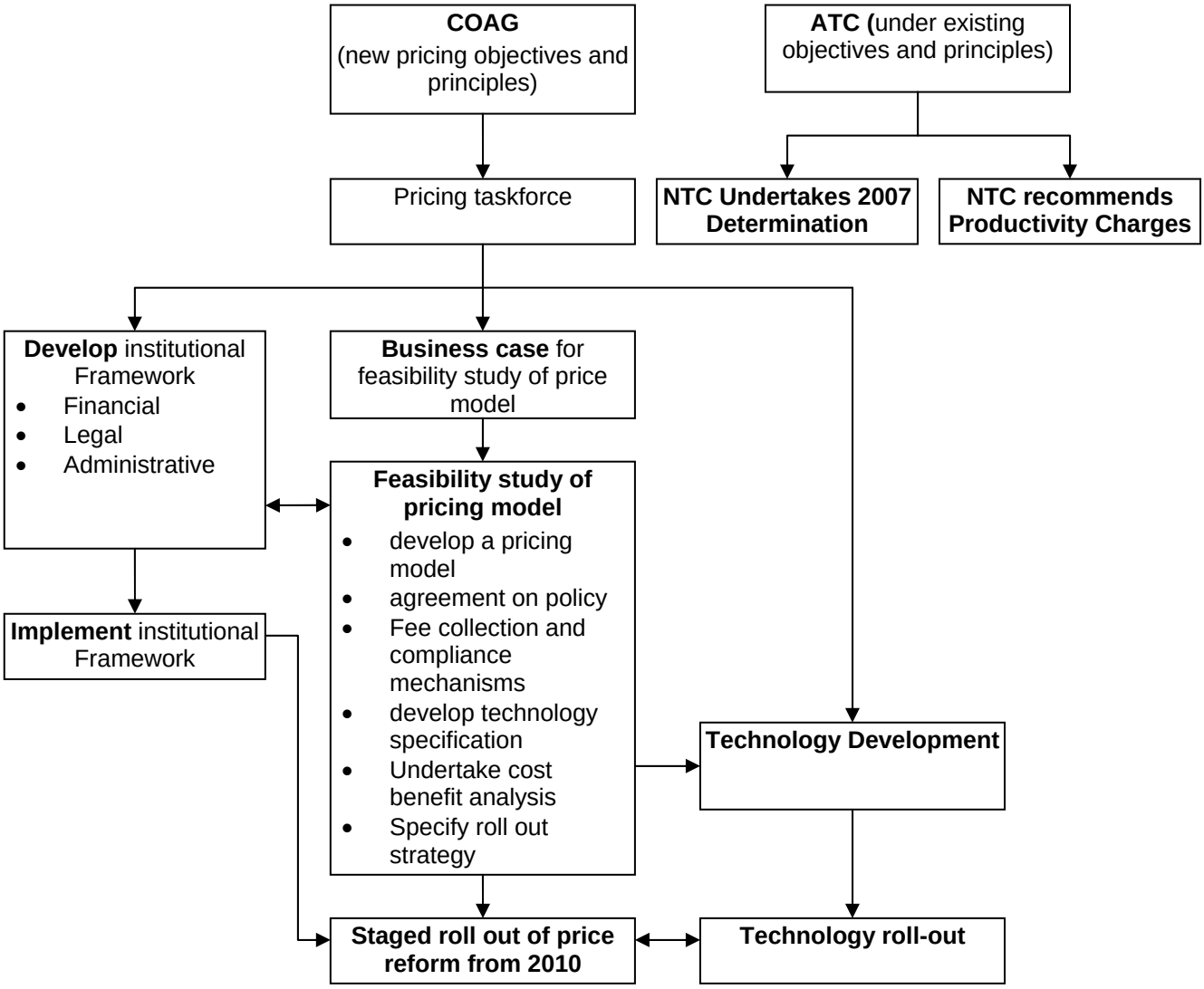

Figure 4. Overview of reform process

5. CONCLUDING COMMENTS

The Productivity Commission's Discussion Draft report comprehensively discusses the key areas of debate between the road and rail freight sectors in relation to charging. In doing so it effectively addressed the issues of externalities, endorsed the PAYGO costing methodology and suggested that pricing is probably not at the heart of competitive neutrality. These findings provide a sound platform to establish a new pricing objective and principles for both sectors.

The Discussion Draft highlights efficiency of infrastructure provision as a key principle of a pricing regime. This submission suggests that the pricing objective for at least road freight should revolve around facilitating operator choice as well as cost recovery. Therefore, efficiency should extend beyond infrastructure provision to infrastructure usage.

Direct pricing is crucial in achieving efficiency operations, particularly for the road sector, where the considerable averaging inherent in the current charging regime means that a vehicles charge for using the network does not generally reflect actual cost of a vehicle's usage of the infrastructure. As a result, operators are unable to make informed decisions about how best to transport freight which minimises the cost of providing freight related infrastructure.

Direct pricing also provides a clear signal for asset providers on the market demand for infrastructure. Currently asset owners are reluctant to provide enhanced access to road operators because of the failure of the current charging regime to adequately compensate them for the additional damage such access incurs on their roads. However a direct pricing regime (which is supported by an institutional framework which enables pricing revenues to flow back to road owners) removes this financial barrier and enables more productive use of the complete road network. It also provides a clearer signal on how the network could be developed in the future which would maximise freight value.

There is considerable uncertainty as to the detail behind a new pricing model for heavy vehicles in the road sector. Therefore the NTC believes that before work on developing a new price model commences, a business case should be developed. The business case would identify the issues which would need to be resolved and provide a fully costed project plan. NTC's initial scoping work has identified a broad direct pricing model to be implemented through a number of stages. The first stage of incremental pricing would provide an excellent low cost opportunity to test attitudes towards direct pricing. The response to the addition to base charges would enable better quantification of the benefits available from more complete reform.

NTC estimates a business case could be completed by the end of 2007 with the first stages of implementation being rolled out towards the end of 2009.

The success of the reform process will depend on the governance arrangements. Given the broad impact of the reform it may be appropriate for a funded pricing taskforce to be established, which reports to COAG.

NTC sees one of the key objectives of this Inquiry as providing a way forward to achieving this kind of outcome. The NTC acknowledges that price reform is not simple and therefore a carefully planned approach needs to be adopted. Considerable work must be done to establish a policy framework which a pricing regime will hang from. This submission has outlined one approach and focuses on just one stream of work which would be required for price reform – the development of a pricing model. However it is only through the clear articulation of pricing objectives and principles should any reform work proceed.

APPENDIX A: HEAVY VEHICLE EXPENDITURE AND USAGE

As the discussion draft acknowledges, heavy vehicle related expenditures are likely to exceed revenues recovered through registration and fuel charges. With these concerns in mind, Transport ministers have requested that the NTC undertake another charging determination in 2007. The NTC is currently in the process of finalising the data inputs that would enable cost allocation and charge determination to occur. Until this is finalised, it is difficult to make precise assessments on whether or not heavy vehicles still recover their costs. However, based on data trends, it is possible to make some judgments on the relativity between costs and revenues.

A strong upward trend in arterial road expenditures can be observed over recent years. The table below shows expenditures on arterial roads for the 4 years to June 2006, presented in real terms for ease of comparison. This incorporates the years of expenditure used in the 3rd Determination, plus one additional year.

Table 4. Arterial road expenditure ($m 05/06)

		2002/03	2003/04	2004/05	2005/06
A	Servicing and Operating	629	684	717	697
B	Road Pavement and Shoulder Construction				
B1	Routine maintenance	421	428	398	409
B2	Periodic surface maintenance	288	320	286	306
C	Bridge Maintenance/Rehab	176	158	167	153
D	Road Rehabilitation	494	510	466	415
E	Low-cost Safety/Traffic	351	288	352	392
F	Asset Extension/Improvements				
F1	Pavement improvements	1149	845	855	956
F2	Bridge improvements	276	302	390	381
F3	Land acquisition, earthworks, other extensions / improvement expenditure	1408	1653	1562	2082
G	Other Miscellaneous Activities	254	246	253	230
G1	Corporate services	98	108	109	94
	Total	5544	5541	5555	6114

As can be observed, there was a strong upswing in expenditure for the year 2005/06. This was underpinned by sharp increases in the Road Construction and Maintenance Expenditure Index (RCMPI), which rose by just under 7% between 2005 and 2006. However, this index does not account for all of the cost increase, as evidenced by the real increase in costs between 2005 and 2006.

For the 3rd Determination calculations, it was necessary to forecast one year of expenditure data and 2 years of the RCMPI, since they were not available at the time. Since then, actual expenditure data and RCMPI values have become available which indicate that the 3rd Determination would have underestimated the costs faced by road owners. Therefore, the quoted aggregate over-recovery figure of $29m is likely to have been over-estimated. Going forward, it is likely that many of the cost pressures evident in the past couple of years (such as labour and oil prices) will continue.

Growth in the fleet means that the increase in expenditures is not directly proportional to growth in allocated costs per vehicle. As the fleet grows, the higher cost base must be divided among a larger number of vehicles. At an aggregate level, the heavy vehicle fleet appears to be growing in number by approximately 2.5% per annum.

However, the pattern of this growth combined with the current charge levels has important implications for the level of overall cost recovery. The 2.5% annual growth conceals variation between vehicle classes. The current charges are based on calculations done for the Second Determination, developed in 1998. At this time, fleet utilisation characteristics were markedly different. Indeed, B-doubles had only just been introduced at the time, and its road wear relationships where only just beginning to be understood. Table 5 below demonstrates how fleet utilisation characteristics have changed over time.

Table 5. Fleet utilisation characteristics 1998 and 2004

	Number vehicles		VKT		GVM-km	
	1998	2004	1998	2004	1998	2004
light	97.0%	97.3%	93.2%	93.4%	15.2%	17.0%
rigid	2.2%	1.9%	3.0%	3.0%	19.8%	19.9%
artic	0.4%	0.4%	2.3%	1.9%	43.1%	32.6%
BD	0.0%	0.1%	0.4%	0.7%	10.7%	19.1%
RT	0.0%	0.0%	0.3%	0.3%	11.3%	11.4%
Bus	0.3%	0.3%	0.7%	0.6%	0.0%	0.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

While an annual adjustment has applied every year since then, the fact that is capped by CPI and is applied only to the registration component of the charge (taking no account of whether or not the vehicle class under recovers) means that the charges do not keep pace with costs. The data suggests that the section of the fleet that under-recovers its costs (most notably B-doubles) is growing the fastest, and the section that over-recovers is remaining static or declining (rigid and single trailer articulated trucks). This suggests that over time heavy vehicles would be less likely to recover their costs.

Of course, it is important to consider the interaction of vehicle utilisation patterns with expenditure profiles. The impact on heavy vehicle cost allocation depends on the expenditure categories experiencing change, and the relevant allocator and its relationship with the changing fleet utilisation. Ultimately, the true extent of over or under recovery within the heavy vehicle fleet can only be revealed through a full cost allocation process as part of a pricing determination.

APPENDIX B: OPTIONS FOR UNDERTAKING AN EFFICIENCY REVIEW

Under a perfectly competitive environment, prices reflect efficient costs. This is because competitive pressures serve to drive down costs. However, this does not necessarily occur with a natural monopoly. Therefore, economic regulators typically undertake efficiency reviews to ensure that consumers are not penalised for the inefficiency of providers and ensure pricing signals enable economic agents to allocate resources efficiency. Adjusting expenditure data used for determining charges for inefficient (and sub-optimal) expenditure is a key tool in minimising pricing distortions.

Learnings from efficiency reviews in other sectors

Transferable experience from other sectors

In monitoring the efficiency of regulated parties or organisations, regulators are very aware that their regulatory outcomes should encourage efficiency in expenditure whilst maintaining or improving service standards. Ensuring that service is not negatively affected by measures to achieve cost efficiency is usually achieved through some form of monitoring of service levels.

There should also be a requirement for ensuring proper accounting for environmental factors outside the control of the regulated party. This is of particular relevance when considering capital investment efficiency.

Unique characteristics of the roads sector

Institutional arrangements

Crucially, under current institutional arrangements, the disconnect remains between road prices, revenues, expenditures and investment. This is not the case for many of the other sectors reviewed, in which determination of recoverable revenues directly influences the level and type of investment and operational expenditure.

Ownership and governance arrangements

The second defining characteristic of the Australian road sector is its ownership and governance arrangements. There are around 700 road related agencies in Australia, encompassing local, state and federal governments. These organisations operate primarily through budget cycles in which funds are obtained from consolidated revenues. They are thus subject to a number of methods of reviewing expenditure already. The vast majority of organisations in other sectors, who are the focus of efficiency reviews, are private organisations. These organisations have either purchased the capital assets outright or engaged in long-term leases with government and subject to regulatory overview as part of the legislative framework of privatisation. The monopoly characteristics of this essential infrastructure, coupled with private ownership, result in a number of outcomes that differ from the Australian road sector. However, it should be noted that prior to the privatisation and consolidation of other sectors, there was also multi-level government involvement. For example, local governments used to own and operate electricity businesses.

Description of possible approaches

Top-down approaches

Partial productivity analysis

Typically the outcome of a partial productivity analysis will be a presented in the form of a ratio of the quantity of an output produced to the quantity of an input used in producing it:

for instance, lane-kilometres produced per person-hour of labour input. In involves the following steps:

1. Determine a set of partial productivity indicators for application and collection by each road agency in Australia
2. Determine a set of service indicators for application and collection be each road agency
3. Determine operating environmental considerations that need to be applied to either each indicator or to each road agency
4. Determine the weighting of each partial productivity indicator in terms of its contribution to the assessment of the overall efficiency of expenditure.
5. Collect data from each road agency
6. Convert each partial productivity indicator to an index
7. Apply the weights to provide a consolidated efficiency index for the agency
8. Compare the road agencies efficiency levels with service quality indicators to determine whether increased efficiency has been the result of a decline in service standards and provide each agency with a service factor that provides an indication of service standards.

Advantages:

- The bases for elements of this approach are indicators already in use.
- The efficiency of expenditure could be assessed not only in terms of whether the funds were spent efficiently, but also whether the allocation of these funds was an efficient decision in the first place.

Disadvantages:

- Major data and transparency issues remain.
- In the development of the performance indicators, there was no expectation by the agencies that the information would be used for purposes such as an efficiency review. This may be problematic.
- There remains a level of subjectivity to the assessment using the partial productivity method
- Asset managers could have an incentive to shift poor performance to an area which is not assessed

Holistic productivity analysis

Effectively, this approach would involve separate benchmarking exercises for the each of the major outputs of a road agency.

This process would involve establishing a consistent database of input and output groupings across road authorities, as well as the establishment of pricing indexes.

There are a number of methods by which the actual benchmarking exercise could be undertaken. These methods include Total Factor Productivity, Data Envelopment Analysis, Stochastic Frontier Analysis and Econometric Constructions. The benchmarking would involve factoring in environmental considerations such as terrain, type of road and drainage conditions.

Advantages:

- The rigour of analysis it provides.
- There is significant expertise available to develop this method given its use in other regulated sectors.

Disadvantages:

- In the short term this approach may be seen as too politically and operationally difficult to develop.
- Unless there is full agreement on the methods used, there will remain the concern that outcomes regarding relative efficiency are not real inefficiencies in expenditure but rather a problem with the application of the technique.
- It will involve significant establishment costs, and will be quite data intensive going forward. It is likely that there is limited availability of expenditure data broken down into comparable categories at a local government level.
- There remain significant consistency issues in the allocation of costs and presentation of output activities at a state/territory level.

Disaggregate cost analysis

This approach takes its foundations from the approaches to efficiency reviews in other regulated sectors. It involves the following steps:

1. Determination of the starting asset base for each agency including an appropriate rate of return on capital
2. Determination of capital, maintenance and operational forecast expenditure by each road agency
3. Review each agency's forecasts by a third-party to determine whether they will lead to efficient outcomes and maintain services levels
4. Provide a determination of the efficiency of each agency

Advantages:

- This approach is akin to the building blocks approach prevalent in many regulated sectors in Australia and overseas, meaning it enjoys a level of acceptance. There are also a developed set of methods and expertise to assist in its development and application.
- This approach is highly rigorous in its application. Because all expenditures are considered, there is little to no room for offsetting inefficiencies in areas not considered in the review.

Disadvantages:

- There are significant costs in the development and implementation of the process.
- The level of detail would be disproportionately large where the approach is intended to accompany a PAYGO method of estimating costs for charging purposes.

Bottom up approaches to efficiency reviews

Whereas top-down approaches assess efficiency by examining aggregated data relating to a period of time, bottom-up approaches, focus on specific expenditure undertaken by the agency. Most often, bottom-up approaches focus on large capital expenditure – either new investment or significant maintenance investment. They often work to augment top-down approaches and can be applied in tandem.

Encouraging improvements in efficiency

Efficiency reviews could be used to more efficiently allocate revenues among agencies. This could be done at various levels of government. The possible approaches would be;

- National revenue allocation, which would not presume institutional change to revenue allocation methods;
- Revenue allocations for state road agencies, which would re-allocate revenues at the state level; and
- Revenue allocation for all road agencies, which would most closely target inefficiencies in expenditures. This would present significant administrational difficulties.

As is intended with the national revenue allocation approach, simply measuring and reporting efficiency levels provides agencies with benchmarks, and therefore incentive to improve on their past performance or on their peer's performance. If best practice methods are effectively communicated, agencies will find it easier to boost efficiency by replicating and modifying best practice.

It would be possible to alter the recoverable cost base for the purposes of charging to remove past inefficient expenditure. It is not in the narrow sense an economic benefit, however it could mitigate concerns with the current system of recovering historical expenditures regardless of whether or not they were efficient.

Careful thought would need to be given to determine whether any under-performance on service was due to (i) deliberate skimping on expenditure, or (ii) lack of adequate funds. The first of these is the problem that the usual regulatory approach is intended to address, and it is attacked by reducing revenue made available to the entity if performance slips. This makes sense with profit-maximising entities. But it is more difficult to argue that a local council or state road agency would behave in this way, as they have no profit-maximising incentive. In this case, service quality deficiencies may reflect a lack of available funds. If this were the case, penalising poor service quality performance would actually aggravate the problem.

APPENDIX C: NTC RESPONSE TO PC DRAFT FINDINGS AND RECOMMENDATIONS

Key draft findings

Draft Finding 3.1

Differences in approaches to charging for the use of road and rail infrastructure largely reflect the different characteristics of each mode. These, in turn, are reflected in their different institutional arrangements — commercial provision of rail and public provision of road.

NTC agrees with this finding

Draft Finding 3.2

More commercial-like arrangements for providing and managing the road network would bring lower-cost, more innovative and customer-focused service provision and more efficient investment. However, there are a number of obstacles, in addition to the need for direct user charging to be cost-effective, including the 'public good' nature of many road services. Consequently, it is doubtful that road provision could or should follow the same commercialisation path as rail infrastructure, although it may be feasible to go some way along it.

NTC agrees with this finding

Draft Finding 3.3

A full assessment of subsidies and other potential sources of price distortion in both road and rail is required to enable judgements to be made about whether competitive neutrality and broader efficiency objectives are being compromised. For example, without knowing the efficient cost of the infrastructure services a truck consumes on a particular trip, price adjustments based on network average cost allocations may not be efficient.

NTC agrees with this finding. NTC, in conjunction with Austroads, has commenced work to better understand cost allocation. It notes that continuing to price on the basis of vehicle type will not result in the complete removal of subsidies and distortions.

Draft Finding 3.4

Failure to account for policy-relevant externalities in road or rail freight prices would distort consumption and production, generating efficiency losses. Care needs to be taken to identify the extent to which external impacts already have been internalised.

NTC agrees that externalities are important and failure to address these can lead to inefficient outcomes. NTC agrees with the Discussion Draft observation that many externalities are currently addressed through direct regulation (vehicle standards and operational requirements) and that current heavy vehicle pricing mechanisms may not be an effective means of addressing safety or environmental externalities.

Draft Finding 3.5

Inefficient pricing can lead to inefficient investment decisions. However, the impacts of poor investment decisions in the past should be rectified only where investments today would likely yield an appropriate pay-off in the future.

NTC agrees with this finding.

Draft Finding 4.1

Under a PAYGO approach, heavy vehicles as a group will pay their way over time, although inter-temporal cross-subsidies could arise if expenditure fluctuates. This has not been a significant feature of the PAYGO system to date, primarily because of national aggregation of the cost base. However, network averaging itself has created cross-subsidies between heavy vehicles accessing different parts of the network.

NTC agrees with this finding, noting that if there is a trend increase in road expenditure related to heavy vehicles, charges will lag behind expenditure.

Draft Finding 4.2

Expenditure on local roads to provide access to homes and businesses is more appropriately recovered through council rates and charges than through the heavy vehicle charging system. Even if more of these costs were included in the cost base, most would appropriately be allocated to passenger vehicles, given their much greater use of the local road network.

NTC agrees that the purpose of local roads is primarily to provide access for light vehicles. However, it notes that heavy vehicle access to the local road network is currently a significant constraint. It is therefore important that local road asset owners are able to recover the cost of the additional damage caused by heavy vehicle use so that access can be granted to those vehicles.

Draft Finding 4.3

The costs of enforcing heavy vehicle mass and speed restrictions are appropriately recovered through road user charges. Any costs recovered should be net of penalty revenues. However, the inclusion of these costs is not likely to have a significant effect on heavy vehicle charges.

NTC agrees that enforcement costs should be recovered. However it notes that any arrangement to do so should ensure that perverse incentives are not created for enforcement agencies to maximise penalty revenue to subsidise enforcement costs rather than to achieve compliance objectives.

NTC seeks clarification of the rationale for offsetting penalty revenues against enforcement costs. Penalties would appear to be a punishment for breaching legal requirements rather than a cost of doing business.

Draft Finding 4.4

That proportion of road spending undertaken solely to meet remote community needs is appropriately excluded from the costs to be recovered through heavy vehicle charges. Any adjustment for community service obligation expenditure in the cost allocation process should apply to all vehicles. However, heavy vehicles should still pay the marginal costs of accessing roads financed through community service obligations.

NTC does not have a firm view on the best means of meeting community service obligations.

Draft Finding 4.5

There is considerable debate about the proportion of expenditure which should be defined as 'common', particularly for pavement maintenance expenditure. The National Transport Commission estimates are at the upper end of those in other available studies.

NTC acknowledges this finding.

Draft Finding 4.6

Although heavy vehicles currently bear a small share of the common costs of road provision, this does not mean that they receive a subsidy.

The most efficient way to allocate common costs is using Ramsey pricing principles. However, there are limits to achieving this in practice. The available evidence suggests that the current approach to allocating these costs (based on kilometres travelled) is likely to be more efficient than alternative approaches that allocate a greater share of common costs to the largest vehicles.

NTC agrees that there are information limitations in the application of any form of price discrimination. It is currently engaged in an Austroads sponsored research program to investigate alternative approaches to cost allocation.

Draft Finding 4.7

There is considerable debate about the relationship between road expenditure and road use. The National Transport Commission cost attribution model results in a lower attribution of costs to heavy vehicles than most of the alternative approaches considered. The Commission supports the National Transport Commission's decision to undertake further work in this area.

NTC agrees with this finding.

Draft Finding 4.8

Based on the most recent data available, road user charge revenues from heavy vehicles more than cover their attributable infrastructure costs and just cover their fully allocated cost. However, following rejection of the Third Determination, cost recovery is unlikely to be maintained if road expenditure continues to rise with no increase in charges.

NTC agrees with this finding.

Draft Finding 4.9

The deliberate reduction in B-double prime mover charges by the National Transport Commission (so that they do not exceed those for road trains) means that, as a class, they do not cover the network-wide costs attributable to their road use. Implications for competitive neutrality are unclear, however, given that network averaged costs allocated to B-doubles operating on the major inter-capital corridors, where road and rail most directly compete, may be higher than their corridor-specific costs.

NTC agrees with this finding.

Draft Finding 4.10

The current road user charging system results in significant cross-subsidies within some vehicle classes. Vehicles travelling longer than average distances and/or carrying heavier than average loads are, all else equal, cross-subsidised by other vehicles within the class. Similarly, vehicles that travel more than average on higher unit cost roads (such as local roads) are, all else equal, cross-subsidised by those using lower cost parts of the network.

NTC agrees with this finding.

Draft Finding 5.1

Replacement cost methods of valuation represent a useful reference point for determining whether rail infrastructure providers are able to recover the full economic costs they incur. Where providers are unable to fully recover economic costs, it is likely that, in the absence of a subsidy, rail infrastructure would not be replaced at the end of its useful life.

NTC has no comment on this finding.

Draft Finding 5.2

Differences in asset valuation techniques and principles for inclusion of assets in regulatory asset bases can result in inconsistencies in measured costs between jurisdictions. These factors can also influence assessments of whether rail infrastructure providers fully recover the economic costs of providing services. Specifically, non-inclusion of assets in regulatory asset bases (such as assets provided by governments) can significantly reduce the measured costs of providers and therefore the charges allowed by regulators. The effect of this on cost recovery is likely to be significant in those market segments where providers are able to charge ceiling prices.

NTC has no comment on this finding but agrees with the principle.

Draft Finding 5.3

While access regimes do not explicitly preclude rail infrastructure providers from allocating proportionately more common costs to less price-sensitive users, it is not clear that the benefits of such pricing are adequately reflected in the approach of regulators.

NTC has no comment on this finding.

Draft Finding 5.4

Rail infrastructure providers are unable to cover the assessed full economic costs on many routes, and often fall well short of doing so. Exceptions to this mainly involve the transport of bulk freight, particularly coal.

NTC has no comment on this finding.

Draft Finding 5.5

Rates of return on rail infrastructure have generally been low and, if tolerated by public sector owners for long periods, could amount to implicit subsidisation.

NTC has no comment on this finding but agrees with the principle.

Draft Finding 5.6

Direct government subsidies to rail are common and, in some cases, have been sizeable.

NTC has no comment on this finding.

Draft Finding 5.7

Community service obligation payments to rail are substantial, but their incidence and subsidisation effects are unclear. There would be benefits in making the objectives and extent of CSO payments more transparent and requiring them to be explicitly funded on-budget. Greater transparency of CSO payments would provide greater assurance that they do not raise competitive neutrality issues, while consistent use of on-budget funding would help ensure ongoing scrutiny of their appropriateness.

NTC has no comment on this finding but agrees with the principle.

Draft Finding 5.8

Rail infrastructure operators generally are unable to fully cover economic costs and often are reliant on government subsidies of various forms to maintain viability. These subsidies are potentially significant in affecting competition between road and rail freight.

NTC does not have access to rail cost information to form a substantiated view on rail cost recover.

Draft Finding 5.9

If heavy vehicle road charges were to increase, this might allow below-rail operators to become more financially viable — either by attracting greater volumes of traffic or by increasing their charges. But if government subsidies were consequently reduced or withdrawn, track operators might be little or no more financially viable than before.

NTC has no comment on this finding.

Draft Finding 6.1

The economically efficient level of an externality is not zero but, rather, occurs where the marginal benefit of reducing external costs equals the marginal cost of doing so. Negative externalities arising from the production or consumption of goods and services can result in inefficiently high levels of the activities generating them. To achieve minimum cost abatement, governments should focus policies on addressing the underlying causes of an externality.

The NTC aggress with this finding and takes this into account when considering regulatory approaches to externalities.

Draft Finding 6.2

In some cases, markets or government interventions internalise at least part of external costs. In road and rail transport, externalities such as the costs of accidents, pollution, congestion and noise are usually created concurrently by both passenger and freight services. In addressing these costs, competitive neutrality between transport modes should be the outcome of implementing efficient externality policies, rather than the objective of those policies.

The NTC agrees with this finding.

Draft Finding 6.3

There is a range of externality costs related to freight transport. However, the externality component is often difficult to determine, both in principle and empirically. Estimated costs of particular externalities range widely due to different methodologies and assumptions. What can be said is that:

- *external costs of freight transport are generated jointly with passenger transport, are much higher in urban areas than in rural areas and are higher for road freight than for rail freight;*
- *there appears to have been significant internalisation of externalities (except for greenhouse emissions) through regulation, legal liability and various other means.*

NTC agrees with this finding.

Draft Finding 6.4

The costs imposed on road users by congestion are:

- *in general, a significant problem only in large urban centres at particular times and locations;*
- *generated by both passenger and freight traffic, with passenger vehicles being the main cause.*

NTC agrees with this finding.

Draft Finding 6.5

An all-encompassing, uniformly applied, externalities charge on freight operators would be an inappropriate and inefficient mechanism for reducing freight transport externalities, many of which are time and location specific. It effectively would impose a tax on freight transport, rather than bringing about cost-effective externality abatement.

NTC agrees that current heavy vehicle pricing instruments may not be efficient mechanisms for reducing transport externalities.

Draft Finding 6.6

Direct pricing of particular externalities in some cases offers the potential to achieve relatively efficient abatement of external costs. However, the difficulties and related costs of identifying and monitoring externality costs for particular freight journeys limit the circumstances in which pricing can be used effectively and efficiently. In order to reduce the likelihood of overcharging for journeys which generate low externalities, any direct charge would need to be set at the lower bound of estimated externality costs and vary with the level of external costs (such as by location).

NTC agrees with this finding.

Draft Finding 6.7

Largely because of difficulties in pricing some freight transport externalities, regulatory approaches often have been the favoured method of reducing these costs. In some circumstances, this might be the most efficient and effective policy response. However, if regulation is to achieve efficient outcomes for these externalities, it needs to:

- *be based on a rigorous cost–benefit assessment indicating that the benefits of reducing an externality are greater than the costs involved;*
- *be targeted at all significant sources of the externality;*
- *where feasible, be performance based and allow freight operators to choose the means of achieving a given externality-reduction target; and*
- *to the extent possible, allow for any time or location specific characteristics of many externalities.*

The NTC agrees with this finding. This approach is followed by the NTC when considering regulatory approaches to externalities.

Draft Finding 6.8

Including an allowance in rail infrastructure investment decisions, or making selective adjustments to road freight infrastructure pricing for the average impact of road externalities, is unlikely to be an efficient way of dealing with freight transport externalities. It does not address the externalities directly, nor assess optimal levels of an externality, nor consider opportunities for other, possibly lower-cost, abatement alternatives.

NTC agrees with this finding.

Draft Finding 6.9

In the absence of economy-wide greenhouse pricing mechanisms, it would be economically costly to pursue national emissions targets by applying taxing instruments solely to key business inputs such as freight transport.

NTC agrees with this finding.

Draft Finding 6.10

Further research into transport externalities in Australia is required to assist the introduction of the most cost-effective policies for attaining efficient abatement of external costs. Research should focus on:

- *the nature and size of transport externalities; and*
- *the extent to which these externalities already are internalised, particularly by policies affecting the decisions of passenger and freight transport users.*

The BTRE is best placed to undertake this research.

NTC agrees with this finding.

Draft Finding 7.1

Different pricing structures for the use of road and rail infrastructure do not, in themselves, imply a lack of competitive neutrality. Competitively neutral pricing requires that prices reflect relative marginal costs in each mode.

NTC agrees with this finding.

Draft Finding 7.2

Based on the available evidence, there is no compelling case for increasing charges for road freight infrastructure users on competitive neutrality grounds. If charges were to increase for road, modelling suggests that even substantial increases are unlikely to have a significant impact on rail's modal share.

NTC agrees with this finding.

Draft Finding 8.1

The technical feasibility of more finely-tuned road user charges, such as mass–distance and location-based charges, is a necessary but not sufficient condition for them to be economically worthwhile. In particular, the potential benefits of direct road user charging will be heavily influenced by the institutional setting within which such charging operates, as well as by the transaction costs of the pricing system itself.

NTC agrees with this finding.

Draft Finding 8.2

Achieving the highest-valued use of resources generally requires prices for goods and services being equal to their short-run marginal social costs. This would also ensure that choices are 'competitively neutral'; that is, that they reflect relative costs. However, the substantial and lumpy investments and economies of scope involved in road and rail infrastructure are likely to render short-run marginal cost pricing infeasible and possibly inefficient.

NTC agrees with this finding.

Draft Finding 8.3

Principally to provide a signal about net economic benefits and to allow arrangements that encourage more efficient service delivery, the total costs of providing freight infrastructure appropriately should be met from users of that infrastructure rather than from taxpayers in general. Self-financing is also 'fairer', in the sense that only beneficiaries of the infrastructure, in the aggregate, pay for it.

NTC agrees with this finding.

Draft Finding 8.4

Prices set to recover each mode's total costs, which accord as closely as possible to Ramsey principles, have the potential to promote efficient use of road and rail freight infrastructure, while meeting a self-financing requirement.

- *While users should be required to cover at least the marginal costs of their infrastructure use, their contribution to (unattributable) fixed or common costs should be inversely related to the price responsiveness of their demand for the services provided, thus minimising efficiency losses arising from discouraged consumption.*

NTC accepts this principle, recognising that it would be almost impossible to apply with current information and pricing instruments.

Draft Finding 8.5

Where transport modes are substitutable, and where pricing structures lead to disproportionate departures from marginal cost pricing in each, joint application of Ramsey pricing principles could minimise these distortions. In practice, the substantial informational requirements must be weighed against potential marginal efficiency benefits. Rough application of Ramsey pricing principles in each mode is likely to offer the best practical solution.

NTC accepts this principle, noting that even 'rough application' of Ramsey pricing principles is problematic with current information and pricing instruments.

Draft Finding 8.6

Ideally, prices should be set to reflect the economic rather than financial costs of providing infrastructure services, so that prices reflect the costs of efficiently providing services into the future, rather than actual capital costs already incurred. In practice:

- *Estimating the economic costs of the road network would be a challenging task, requiring judgements to be made about the appropriateness of existing road infrastructure and likely future requirements.*
- *To capture the full efficiency benefits of such pricing, prices reflecting economic costs should be able to elicit efficient investment. This requires institutional and incentive frameworks that link revenues to investment and which encourage price-responsive decision-making.*

NTC agrees with this finding. Incremental pricing, with revenues provided direct to road owners, would be a step in this direction.

Draft Finding 8.7

Opportunity cost is the appropriate approach to land valuation from an economic efficiency perspective. For road and rail networks as a whole, the opportunity cost of land is its value in the next best alternative use, without the benefits conferred by access to transport networks. For incremental road and rail projects, the appropriate land value is its market value without the project.

NTC agrees with this finding.

Draft Finding 8.8

Prices charged to users of freight transport network services should at least cover the directly attributable or incremental costs of providing the services they consume.

NTC agrees with this finding.

Draft Finding 8.9

To ensure that road and rail freight users are neither taxed to pay for, nor subsidised by, community service obligation spending, expenditure undertaken for such purposes should be undertaken in a transparent manner, with objectives made explicit and pursued in least-cost ways.

NTC agrees with this finding.

Draft Finding 8.10

The transaction costs of achieving greater pricing accuracy must be weighed against the potential efficiency benefits.

NTC agrees with this finding. Changes to the current approach to pricing of heavy vehicles must be based on appropriate cost-benefit analysis.

Draft Finding 8.11

Introduction of simple mass–distance charges solely to remove one of many levels of averaging in the current system may not justify the costs (and possible distributional impacts).

However, distance-based charges could establish a 'technological' platform for location-based charging, providing an intermediate step from an input tax to a form of direct road pricing.

Mass–distance charges also could provide a dedicated (and certain) source of funding for a road fund.

NTC agrees with this finding.

Draft Finding 8.12

Mass–distance location-based charges have the potential to bring substantial efficiency benefits. But they also could entail substantial costs and pose some formidable implementation challenges. In particular, institutional arrangements for providing roads would need to change to deliver the full benefits of pricing reform. This suggests that a cautious, incremental approach would be warranted to allow satisfactory resolution of these issues.

NTC agrees with this finding, noting also that appropriate governance structures must be developed for the feasibility study and design of institutional arrangements.

Draft Finding 9.1

Under current institutional arrangements, heavy vehicle road-user charges are set, in principle, to recover current road spending allocated to heavy vehicles, rather than to fund efficient future levels of road expenditure. Moreover, for the most part, the revenues received from the charges are treated as general government revenues rather than as funds directly available for spending by road agencies. There is no systematic linkage between how charges are set and the revenues they generate, on the one hand, and decisions about desirable future levels of road funding, on the other.

NTC agrees with this finding.

Draft Finding 9.2

Heavy vehicle road-user charges, as currently determined and applied, understandably appear to road operators more like taxes than prices. Moreover, they offer, at best, weak signals to decision-makers about the desirable level and pattern of future road spending and, combined with funding arrangements for road spending, create incentives for road managers to preserve existing road assets rather than facilitating their optimal use.

NTC agrees with this finding.

Draft Finding 9.3

Current road funding arrangements potentially lead to inefficiencies and distortions in road management and investment decision-making.

The Commission is not in a position to assess the many claims suggesting that road infrastructure expenditure is, and has been for some time, inadequate. However, a range of evidence suggests that there is scope to improve investment outcomes by making decisions more responsive to the needs of road users.

NTC agrees with this finding although notes that the needs of heavy vehicles are generally more commercial than those of light vehicles and this should be taken into account in the development of a new charging regime.

Draft Finding 9.4

Future road infrastructure requirements are expected to increase substantially, placing greater pressure on the current budget-based road funding system. Alternative funding arrangements increasingly will need to be considered.

NTC agrees with this finding and notes that a movement towards direct pricing will reduce the pressures associated with obtaining funding from taxation sources.

Draft Finding 9.5

Full implementation and application of the AusLink decision-making framework across all jurisdictions would likely lead to some improvement in road investment decisions. However, it is yet to be seen how effective the AusLink processes will prove to be in practice.

NTC agrees with this finding.

Draft Finding 9.6

The departmental approach to funding road provision is characterised by poor accountability to road users, the absence of pricing that is responsive to costs and demand, and the lack of a systematic link between road revenues and efficient future expenditure. It provides a weak connection to the underlying needs of road users and their willingness to pay.

NTC agrees with this finding.

Draft Finding 9.7

Hypothecation of the revenue from road charges and taxes can yield benefits, but these are unlikely to be realised within the existing departmental model.

NTC agrees with this finding although notes that greater usage information which can be provided through direct pricing gives a stronger basis for budget bids. NTC also notes that there is scope for reform of heavy vehicle road pricing and funding arrangements within current institutional arrangements, including through incremental pricing with revenue provided direct to road owners.

Draft Finding 9.8

Compared with present arrangements, a Road Fund model would facilitate more efficient decision-making, funding and provision of road infrastructure. Appropriately-designed, a Road Fund could provide a regular and reliable source of road finance, improve governance of road funds and efficiently discipline road spending. However, to be effective, a Road Fund needs to have a dedicated source of funds, a significant degree of autonomy and transparent processes for allocating funds efficiently.

Implementing this model in Australia would pose a number of particular challenges, principally because of different responsibilities of different levels of government. While each jurisdiction could operate its own fund, a single national road fund would provide a more direct and transparent linkage between heavy vehicle charges and efficient road expenditure. However, there are a number of issues that would require inter-jurisdictional agreement, including:

- *which road-related revenues would be hypothecated to the Fund (vehicle registration fees, fuel excise taxes and/or some form of mass-distance charge);*
- *how future revenue requirements and heavy vehicle charges would be determined; and*
- *criteria for efficiently allocating funds to road projects and between road agencies.*

The NTC has assumed the road fund receive all road charges revenue (including from light vehicles) due to road infrastructure expenditure serving mixed needs. Whilst the NTC is fully supportive of institutional arrangements which better link revenues with expenditure, it is concerned that heavy vehicle investment needs may receive a low priority through a

road fund due to the fact that light vehicles consist of 80% of the road fleet and recover a greater share of total road expenditure through light vehicle charges.

NTC agrees there are a number of implementation issues associated with any institutional arrangement. These should be identified through a business case before any particular model is disregarded.

Draft Finding 9.9

The public utility model could bring greater potential benefits than a Road Fund by introducing market incentives to the provision of roads. Government road enterprises faced with a commercial imperative could be expected to deliver greater efficiencies and innovation in the provision of road infrastructure services.

However, implementation of the public utility model would require cost-effective location-based pricing and raises some important additional implementation issues relating to market power, distributional impacts and public access.

NTC agrees there are a number of implementation issues associated with any institutional arrangement. These should be identified through a business case before any particular model is disregarded.

Draft Finding 9.10

The private ownership and provision of roads on a network wide basis is currently neither feasible nor desirable. However, private sector involvement in providing road management and/or provision of elements of a road network can yield efficiencies.

NTC agrees there are a number of implementation issues associated with any institutional arrangement. These should be identified through a business case before any particular model is disregarded.

Draft Finding 10.1

Performance-based regulation is likely to result in greater efficiency and productivity in the road freight transport sector than the existing, largely prescriptive, regulatory framework. The Commission considers that a move to a performance-based regulatory framework for heavy vehicles is a priority reform. Full implementation of the Performance Based Standards project under the National Transport Commission should be implemented as soon as feasible.

The NTC welcomes the PC support for this policy initiative.

Draft Finding 10.2

There appear to be no benefits, and some costs, in maintaining or implementing vertical separation on regional rail networks where infrastructure providers are unable to exert market power.

The NTC does not have a view on this finding.

Draft Finding 10.3

Greater flexibility in the allocation of train paths has the potential to promote greater efficiency. Auctioning potentially has significant benefits but may not be cost effective. Development of cost effective mechanisms designed to reveal valuations placed on train paths by users is to be encouraged.

The NTC does not have a view on this finding.

Draft Finding 10.4

There is considerable scope for greater national consistency and coordination in rail access regimes, pricing and other regulatory frameworks — including in operational practices and technical standards.

The Australian Transport Council has recently approved the national Rail Safety Bill 2006 and will recently consider supporting regulations. Implementation of this legislation in States and Territories, as agreed, will provide a consistent national regulatory approach to rail safety.

Draft Finding 10.5

There are efficiency gains to be obtained from a single institutional framework for safety regulation of rail. The adoption of nationally consistent rail safety regulation legislation by July 2007 is, therefore, a priority.

NTC agrees with this finding.

Draft Finding 10.6

There are significant potential economic benefits from achieving a nationally consistent approach to access regulation of the rail sector. The reform measures agreed by COAG in February 2006 represent a way forward to achieving such consistency. Progress of the current agreed COAG reforms should be monitored to determine whether there are likely to be additional net benefits from moving to a single national regulator or regulatory regime.

NTC has no comment on this finding.

Draft Finding 10.7

In view of the lack of market power of vertically separated below-rail operators competing with road freight, there is likely to be a strong case for price regulation only for coal lines in New South Wales and Queensland and for those parts of the network where below-rail operators also run above-rail services.

NTC has no comment on this finding.

Draft Finding 10.8

The recent adoption of the recommendations from the Productivity Commission's 2001 National Access Regime report, particularly relating to the inclusion of an objects clause and pricing principles, is likely to reduce the potential for access regulation to discourage investment.

NTC has no comment on this finding.

Draft Finding 10.9

Adoption of the ATC guidelines on investment evaluation across all jurisdictions by December 2006 should promote more consistent investment decisions and improve the efficiency of investment in transport infrastructure.

NTC agrees in principle, but has no direct involvement in investment evaluation.

Draft Finding 11.1

A national road fund has the potential to improve the efficiency of road spending decisions, but, to achieve this, it would need to operate with a high degree of autonomy reinforced by appropriate governance arrangements and transparent processes, and also would require inter-jurisdictional agreement about processes and criteria for setting heavy vehicle charges and allocating funds. These are complex issues on which further input is sought.

NTC has no view on this finding but considers that the effectiveness of pricing and spending related to heavy vehicles could be considerably improved in advance of substantial changes to institutional arrangements.

Draft Finding 11.2

Location-based charging on major freight routes has the potential to bring significant additional efficiency benefits, especially if accompanied by more commercially-oriented road infrastructure provision. But the formidable implementation issues, including how to resolve 'boundary' issues and how to charge for non-freight road use, as well as the potential distributional implications flowing from a breaking down of network averaging and cross-subsidisation within current charging arrangements, require detailed investigation.

NTC agrees with this finding and proposes a feasibility study be undertaken to develop a detailed charging model, resolve associated implementation issues and undertake a cost benefit analysis of a new charging regime.

Draft recommendations

Draft Recommendation 11.1

The corporatisation model should be more strictly applied to government-owned railways in order to improve industry performance. Particular priorities include greater clarity of objectives, improved transparency of the external governance role of ministers, and a general strengthening of accountability.

Greater transparency of funding of Community Service Obligations — including enunciation of objectives, and demonstration of how contributions will achieve stated objectives at least cost — should be introduced as soon as possible, among other things, to facilitate fully commercial provision of rail freight operations.

NTC supports the greater transparency of Community Service Obligations.

Draft Recommendation 11.2

National consistency and coordination in rail regulatory frameworks — including of safety, operational and technical standards — should be expedited.

The NTC notes that it is important to consider:

- The legacy of past investment in different rail gauges, communication systems, signalling systems (noting that different safe working rules are, in the main, a function of the different infrastructure) is very costly to rectify.
- Consistency would, in-principle, enable more on-track competition, however, questions need to be raised about how widespread the potential for on-track competition is.
- National consistency between networks (particularly from a technical perspective) would enable greater inter-connectivity between networks enabling rail to fulfil freight tasks that had previously not been possible due to various manifestations of the break of gauge problem. However, again its significance depends on the level of latent demand for such freight movements.

These considerations would suggest that implementing a nationally consistent approach should be taken cautiously and would require empirical testing.

Draft Recommendation 11.3

Progress in implementing the February 2006 COAG agreement to adopt a nationally-consistent approach to regulation of all nationally significant infrastructure, should be monitored in relation to rail to determine whether there are likely to be additional benefits in moving to a single national regulatory regime and regulator.

The objects clause, declaration thresholds and pricing principles (which, among other things, allow for multi-part pricing and price discrimination when they aid efficiency) now embodied in Part IIIA of the Trade Practices Act should be incorporated in all rail access regimes.

NTC agrees with a nationally consistent approach to safety regulation.

Draft Recommendation 11.4

There appears to be scope to moderate or even revoke access regulation where pricing by vertically-separated below-rail operators is significantly constrained by competition from road and sea freight transport operators. Building on COAG's agreement to promote nationally-consistent access regulation of major infrastructure, a process should be established for reviewing the need for access regulation of vertically-separated rail networks.

NTC has no comment on this recommendation.

Draft Recommendation 11.5

Given the mixed success of vertical separation in encouraging above-rail competition, whether allowing vertical reintegration of particular rail lines or networks would promote their commercial viability should be subject to detailed independent examination.

NTC has no comment on this recommendation.

Draft Recommendation 11.6

Prescriptive regulations that restrict particular types or configurations of heavy vehicles from using all or some roads, should be replaced, where possible, with performance-based regulations to promote flexibility, innovation and greater productivity in the road freight sector. The proposed package of Performance Based Standards to be agreed upon and implemented by all jurisdictions by end 2007 is a major step forward and it is important that the announced timetable is met.

NTC supports this recommendation but notes that a charging solution is required to fully realise the benefits of PBS (PBS is currently constrained to productivity gains that do no additional damage to the asset).

Draft Recommendation 11.7

Regulations applied to the road transport sector should be rigorously evaluated in accordance with regulatory impact criteria, to identify least-cost approaches and demonstrate net benefits. The appropriateness and cost-effectiveness of existing regulations in the sector also should be systematically reviewed, consistent with COAG's commitment that all governments undertake targeted annual public reviews of existing regulations.

NTC supports this recommendation. NTC applies regulatory impact processes approved by COAG and has initiated regular review of all road and rail regulation which has been developed through the national process.

Draft Recommendation 11.8

To improve existing investment decision-making frameworks, road infrastructure funding mechanisms should include a clear project selection process, stakeholder involvement and public transparency, including formal procedures for public consultation. These principles have been broadly adopted as part of the AusLink framework for investing in the national highway system and endorsed by COAG. They should be applied across all jurisdictions as soon as possible.

NTC supports this recommendation.