



Australian Government
Productivity Commission

Road and Rail Freight Infrastructure Pricing

Productivity
Commission
Inquiry *Overview*

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Key points

- Efficient freight infrastructure is of particular importance to Australia, given its dispersed population and production centres.
 - Current pricing and regulatory arrangements are hampering the efficient provision and productive use of road and rail infrastructure.
- Maintaining cost recovery for road freight infrastructure is an important objective. Heavy trucks have been more than paying their way in aggregate under the PAYGO system administered by the National Transport Commission.
 - However, cost allocations have been ‘conservative’ and are being reviewed.
 - The recent surge in road spending makes it likely that heavy vehicle charges will need to rise.
- Competitive distortions *between* road and rail have been limited and not a significant source of market inefficiency.
 - The case that road is subsidised relative to rail is not compelling, even accounting for externalities.
 - And even if network road charges were greatly increased, rail would not derive much benefit given limited substitutability and much complementarity between the two transport modes.
- The main efficiency losses with current road charging arrangements derive from the averaging of costs and charges under PAYGO, and the disconnect between road revenue and spending decisions.
 - These provide poor price signals and distort the incentives needed for efficient road use and provision.
- Developments in road pricing technology create the opportunity for more cost-reflective pricing which, combined with institutional changes to link road supply and demand, offer the potential for substantial efficiency gains.
- Given the costs and uncertainties, and potential distributional impacts, a sequential approach to reform is needed, overseen by COAG.
 - This should begin with improvements to the PAYGO system, coupled with regulatory reform and improved investment decision-making processes.
 - The next phase would involve incremental pricing for trucks currently excluded from parts of the network, and institutional reforms (to help connect revenues and spending decisions, and reduce political influence), before moving to introduce wider location-based pricing.
 - Each step should be preceded by more detailed examination of costs, benefits and distributional impacts, and identification of appropriate adjustment mechanisms.
- Regulatory reforms would have a more beneficial impact on rail’s performance than increases in road charges.

Overview

Most goods produced and consumed in the Australian economy are transported at some stage. With Australia's dispersed population and production centres, the efficiency of freight transport, and of the infrastructure it uses, are important to this country's economic performance, particularly with the projected doubling of the freight task over the next 20 years. This growth also underscores the need to take into account the wider community impacts of road and rail freight transport.

This report, which stems from a decision of the Council of Australian Governments (COAG), focuses on potential causes of inefficiency in road and rail freight. In particular, it addresses concerns that the different charging arrangements for use of road and rail freight infrastructure might be distorting modal choices and leading to inefficient infrastructure investment decisions. It examines the need for, and scope to, introduce more cost-reflective and demand-responsive pricing of road freight infrastructure.

Given that rail now operates largely within a commercial setting, most of the analysis about appropriate charges and potential pricing reforms relates to road infrastructure. However, the report also examines regulatory and other reforms that would enhance the efficiency and productivity of rail as well as road freight. Indeed, such mechanisms are shown to be particularly important in improving rail's commercial viability.

Road and rail compared

Rail freight appears to be under pressure in some markets, but is performing well in others. Indeed, for the past 20 years or so, road and rail have carried roughly equal shares of the total freight task, with both increasing their market shares at the expense of sea freight.

However, the types of freight that rail and road carry differ. Rail is best suited to heavy bulk commodities with regular, large volumes and long-haul cargoes. Rail accordingly dominates the bulk freight task (especially the carriage of coal and other minerals) and also the long-haul east–west corridor.

Figure 1 Both road and rail freight have expanded, at the expense of sea
Billion tonne kilometres

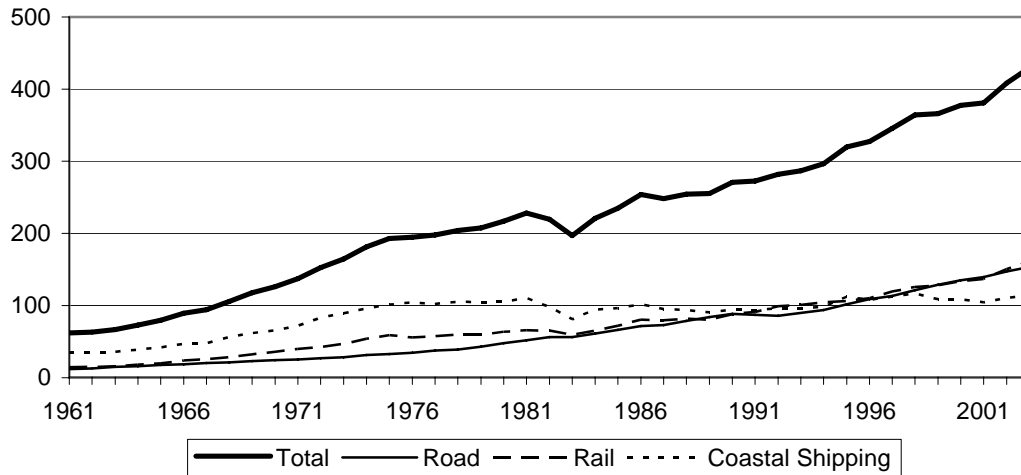
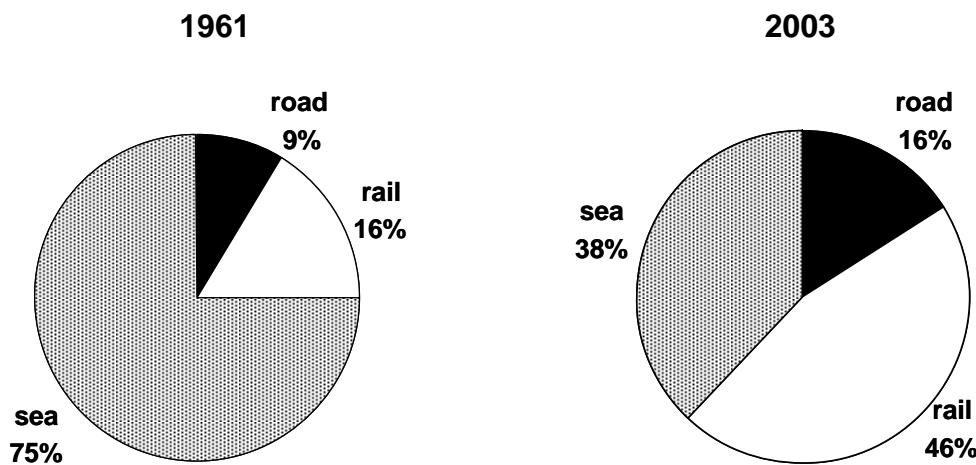


Figure 2 Rail dominates the bulk freight task
Tonne kilometres



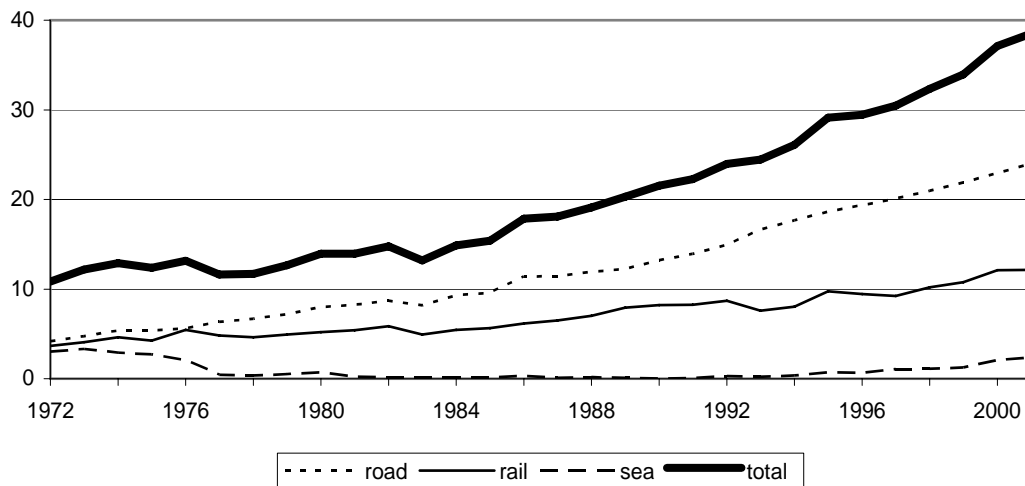
Road freight is more flexible than rail and is especially suited to carrying perishable, fragile or time-sensitive freight. Together with improved on-board communications, this flexibility has facilitated the use by business of just-in-time stock management, smaller inventories and door-to-door delivery, which require more frequent and generally smaller, shorter-haul deliveries. The productivity of road transport also has improved with the introduction of larger capacity trucks, such as B-doubles and now B-triples.

Table 1 Truckspotter's guide

Rigid truck	
Semi-trailer	
B-double	
Road train	
B-triple	

As a result of the inherent differences in the service characteristics of road and rail, only a small proportion of the total freight task is considered to be contestable across the two modes — most estimates are around 10–15 per cent.

Figure 3 Road dominates the growing inter-capital non-bulk market
Billion tonne kilometres



While rail has been increasing or maintaining its share of some long-distance and most bulk tasks — especially in coal, metal ores and grain — it has been losing market share (but generally maintaining volume) on the shorter, predominantly non-bulk, north–south freight corridors, where road freight dominates. These routes have been the principal focus of the debate about road–rail price neutrality, although the two modes are increasingly competing for bulk freight in some regions.

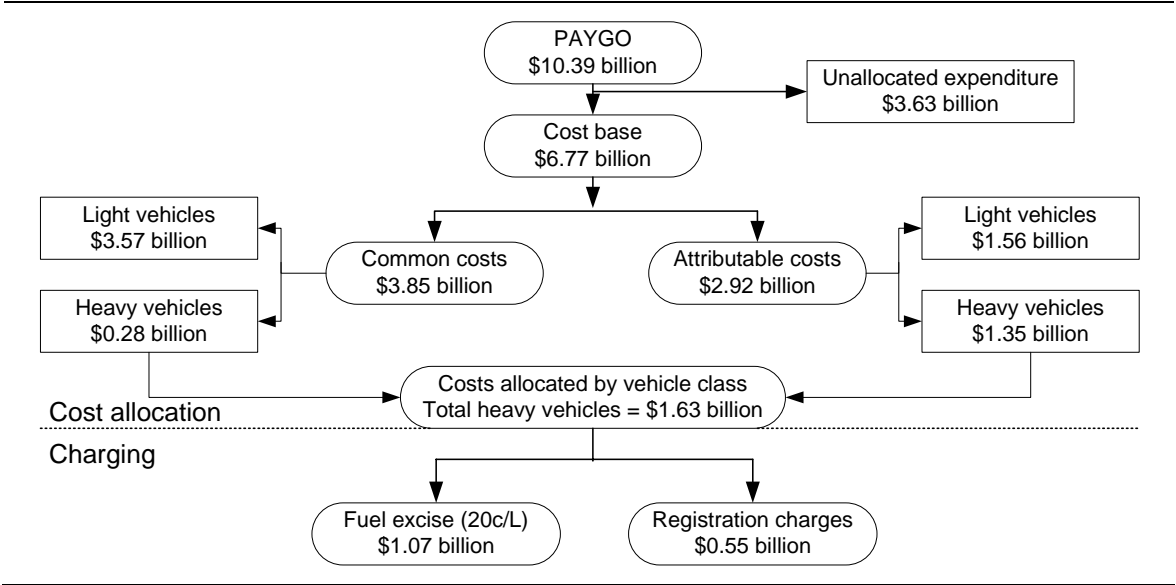
Are heavy trucks ‘paying their way’?

Heavy vehicles currently pay registration charges (which vary by truck type to capture varying axle-load damage) and a diesel fuel excise of just under 20 cents

per litre (net of rebates). The National Transport Commission (NTC) makes recommendations to Transport Ministers about the appropriate level of charges to recover road expenditure attributable to heavy vehicles (those over 4.5 tonnes), plus an allocated portion of spending that cannot be attributed to any specific class of vehicle, called ‘common costs’.

Of total road spending Australia-wide of around \$10.4 billion (the annual average for the three years to 2004-05), heavy vehicles were required to pay a little over \$1.6 billion. Many argue that this is too low.

Figure 4 Heavy vehicles’ share of road spending 2004-05



What *should* trucks pay?

A threshold question concerns which costs, in principle, trucks *should* pay. From an economic perspective, provided they at least cover the costs attributable to their use of the road network then, strictly speaking, they are not being subsidised. Attributable costs are those costs that trucks are responsible for creating — including deeper pavements and extra damage to roads necessitating more maintenance. Put another way, trucks are not being cross-subsidised *provided those otherwise paying for the network pay no more when trucks also use it.*

But the ‘common costs’ of road also must be paid for. Road freight has an inherent advantage over rail in that roads are also used extensively by passenger and other light vehicles. This means that many costs (including, for example, street-lighting, signage and traffic management, as well as the minimum pavement costs for light-vehicle use) which are ‘common’ or ‘unattributable’ can be largely shared with other road users. There is no ‘right’ way to allocate common costs, except that

efficient allocation would require charging those users with lower price sensitivities proportionately more.

‘Spillover’ or ‘externality’ costs imposed on the community (such as the costs of accidents and air pollution) also should be incorporated in road freight costs and prices — although, as discussed later, not as a rule through current road user charges.

Box 1 Efficient pricing of infrastructure services

- Charges overall should recover the *total* costs of providing (efficient) infrastructure, and be structured to avoid distorting consumption choices.
- Prices charged to freight users of transport network services should at least cover the attributable costs of providing the infrastructure services they consume. For heavy vehicles, this means at least paying for additional network costs, such as for deeper pavements, stronger bridges, and additional maintenance.
- Non-separable (‘common’) costs of providing road and rail infrastructure should be recovered in the least-distorting manner, which ideally requires users with lower price sensitivities paying proportionately more.
- In principle, prices should be set to reflect the economic rather than financial costs of providing infrastructure services.

Problems with PAYGO

Several participants argued that the ‘PAYGO’ methodology applied by the NTC significantly subsidises road freight, because users are not charged a rate of return on the capital outlaid. The Commission has found, however, that there is no subsidy ‘in principle’, since road users pay for capital spending in full as it is incurred, including the opportunity cost of that capital (box 2).

Moreover, the claim that today’s road users are benefiting from roads funded by past taxpayers, is not supported by the evidence. Although heavy vehicle road charges as such have applied only since the mid-1990s, diesel fuel excise has existed since 1957 (reaching high levels in real terms in the 1980s and 1990s), and was introduced for the express purpose of contributing to road costs.

Box 2 Capital costs are fully recouped under a PAYGO approach

Under a pay-as-you-go approach (known as PAYGO), capital spending is recovered in the period in which it occurs. This means that users of roads, rather than road providers, effectively fund the investment. In principle, therefore, PAYGO does not subsidise freight infrastructure users compared with an approach where users are charged an amount each year that covers asset depreciation and a return on capital.

Clearly, however, the *time pattern* of payments can differ. In years when capital spending is higher than average, users in a PAYGO system will pay more than those paying on an annualised basis. By the same token, they will pay less in years in which capital spending is relatively low.

The PAYGO system operating in Australia attempts to reduce the potentially uneven path of charges and potential for cross-subsidisation among road users over time by spreading charges for road investments across *all* network users and by using a 3-year spending average to calculate charges for each pricing determination.

Are trucks at least covering average network-wide costs?

Within the framework of the present cost recovery model, the Commission's assessment is that, until recently, heavy vehicles *as a group* were more than covering the network-wide costs attributable to them. (That said, the NTC's estimates are towards the lower end of various attribution methodologies.) But substantial increases in road investment in the past couple of years now make it likely that heavy vehicle charges would have to rise to maintain cost recovery.

There has been some over- and under-recovery by *vehicle class*, however, reflecting constraints imposed by the current structure of charges and, for B-doubles, a deliberate attempt to influence the choice between them and road trains. Thus B-doubles as a class have not been covering their *attributable network* costs, whereas semi-trailers and rigid trucks have been more than covering those costs.

Box 3 Are current cost attributions reasonable?

In getting from \$10.4 billion in road expenditure to the \$1.6 billion allocated to heavy vehicles (figure 4) two steps are particularly important.

- The NTC currently excludes a significant proportion of road expenditure (\$3.6 billion) from the cost base. A large part of this comprises the costs of providing local access. The Commission accepts that local access costs, in most cases, are more appropriately recovered through council rates and developer charges than through the heavy vehicle charging system.
 - Regulatory enforcement costs have also been excluded from the cost base, but the Commission considers that these should be included.
- Estimated common costs of road service provision are also very large — nearly \$4 billion — reflecting the significant shared use of most roads.
 - Even if the NTC took a less conservative approach to attributing costs to heavy vehicle use, common costs would still be large, as roads would continue to be provided for light vehicles (which account for about 90 per cent of all road use), even if not to the strength required for trucks.
 - There is not a strong case for altering the current approach to allocating common costs under PAYGO (according to vehicle kilometres travelled) to one which places a larger share on heavy vehicles.

Are trucks covering their actual costs of road use?

A major problem with PAYGO in practice is created by averaging costs across the network. This blurs price signals and leads to cross-subsidies from operators carrying light loads to those carrying heavy loads, from users of lower-cost roads to users of high-cost roads and, indeed, to those benefiting from roads that may be justifiable on social but not economic grounds.

Thus, even if some truck classes (especially B-doubles) do not meet their attributable share of network-wide expenditure, ascertaining whether they are being truly subsidised requires knowledge of the roads they actually use. In general terms, B-doubles tend to operate on major interstate corridors, whereas smaller rigid trucks operate predominately in urban areas and road trains are almost entirely confined to rural areas.

Available evidence, though limited, consistently indicates that the unit costs of heavy vehicles using most major freight corridors are lower than the costs of their use of rural arterial and local roads, and thus lower than assessed network-wide average costs. This is not really surprising, as the marginal costs of using highways designed and built to carry heavy vehicles are very low. Although the total capital costs of these roads are high, commensurately high traffic volumes and economies

of scale in pavement construction ensure that *unit* capital costs are also low. By the same token, the costs of heavy vehicles using rural or arterial roads that were not built for that purpose, and that have relatively low traffic levels, are likely to be significantly *above* the network average.

Community impacts ('spillovers') must also be taken into account

The costs that trucks impose on local communities, and on other road users, reduce community wellbeing. Such spillovers or externalities are also a potential source of competitive distortion, because they are generally much larger than for rail freight. They include:

- accident costs (borne largely, though not entirely, by users);
- environmental impacts, including noise, pollution and degraded amenity, as well as so-called intrusion impacts (borne by local communities and other road users);
- greenhouse gas emissions (which have global impacts); and
- congestion (borne by infrastructure users, including those who take action to avoid peak periods).

In practice, externalities are difficult to measure and existing estimates are subject to considerable variation. Moreover, observed levels of externalities such as noise or pollution are not necessarily inefficient. Efficient levels of external costs will rarely be zero, given community benefits from transport activities and the costs of securing externality abatement. In practice, a variety of measures currently in place already address external impacts and, in some cases, appear to do so to a significant extent. These measures have imposed (sometimes high) costs on road freight operators, which are reflected in higher freight prices (box 4).

Where existing measures to address externalities from heavy vehicles are inadequate, efficient abatement generally requires that the sources of the externalities be targeted.

- It is highly unlikely that imposing a uniform tax on *all* road freight vehicles, regardless of where they travel and when, would be either an efficient or effective remedy. This is because most external impacts of freight transport occur in urban areas, or are confined to certain roads or times, yet harmful impacts would only decline in response to a general tax to the extent they were linked to overall network use. (Location-based charges, discussed below, potentially enable better targeting of localised externalities.)

In addition, applying a tax only on freight transport to reduce, say, air pollution or traffic congestion in an urban area, would at best only partially address the problem, because light vehicles also produce these impacts. Similarly, selectively taxing greenhouse emissions from road freight (which amount to less than 3 per cent of Australia's emissions) could have perverse results.

Box 4 How some 'external' costs of road freight are being addressed

- *Accident costs* are internalised to a significant degree through a variety of mechanisms. These include liability laws (insurance adds about 2¢ per net tonne kilometre for interstate freight), road safety programs, expenditure which improves the safety of roads, initiatives in road design, road rules enforcement, measures to influence driver behaviour (including fatigue regulations), motor vehicle design and safety features, and drivers' concern about road safety.
- New standards for *emissions* from diesel vehicles began in 2002-03, significantly reducing emissions of particulate matter and nitrous oxides.
- New trucks must comply with *noise emission* standards relating to engine and exhaust technologies that produce lower noise emissions. In addition, there are movement restrictions on specified types of vehicles to limit noise pollution.

Is rail freight paying its way?

In contrast to road provision, Australia's rail infrastructure now generally operates within a commercial structure. Nevertheless, charges for many rail services fall well below their long-run economic costs, as assessed by regulators, at least if the expectation is that current services will continue. (The exceptions are generally in the bulk freight areas, particularly coal.) While low rates of return are not uncommon for a time in any industry, where government owners tolerate low rates of return for extended periods, this amounts to implicit subsidisation.

In addition, there have been substantial periodic injections of public funds for major rail corridors and some regional lines, with no apparent expectation of recovery from users (box 5). At least some of these contributions are intended to keep lines open that otherwise would not be commercially viable.

Box 5 Recent government financial contributions to rail infrastructure

- Under the AusLink Investment Programme, the Australian Government is providing \$550 million to improve the line between Melbourne and Brisbane, plus \$270 million to install concrete sleepers. Another \$544 million is being provided for other rail and intermodal projects on the AusLink network (DOTARS 2006c).
- In 2005, a deal was struck between the Australian and South Australian Governments to contribute \$30 million towards upgrading the Eyre Peninsula rail system. The Australian Government will provide \$15 million to be matched by the South Australian Government, industry and local councils. The Eyre Peninsula rail line carries over two million tonnes of grain each year, but is in very poor condition. Government funds are regarded as essential to its ongoing viability (Anderson and Conlon 2005).
- Under a proposal to maintain the Tasmanian rail service (otherwise threatened with closure), the Australian Government will provide \$78 million for capital works, with the Tasmanian Government injecting \$4 million a year for 10 years (Cox 2006b).

Some financial contributions to rail are called community service obligations (CSOs) because they support access to particular communities. It is likely that these also partly assist rail freight, but the extent of this is clouded by lack of transparency regarding the objectives and incidence of the payments.

What are the implications for competitive neutrality?

In sum, the Commission has not found a compelling case that heavy vehicles competing with rail freight on major north–south corridors are *relatively* subsidised. Corridor-specific data that are available are consistent with logic in suggesting that the unit costs of use of these ‘built-for-purpose’ routes are lower than average network costs and, for many heavy vehicles, are likely to be below current charges. For rail, significant government financial contributions allow access charges to be set below the long-run economic costs of providing freight services on major corridors.

The flipside of this, though, is that the cost of heavy trucks using many rural local roads and lightly-used arterials is likely to be well above the network average charge. But many regional rail networks which compete with road for some bulk tasks (the haulage of grain, for example) are themselves subsidised, making it difficult to assess the *relative* distortion.

Further, while trucks generate larger external impacts than rail, policy-relevant externalities are low on the major corridors. The highest externality costs of road

freight transport occur in urban areas. However, these are largely common to rail freight journeys as well, given the need in many cases for truck pickup and delivery.

While some have argued that more comprehensive work should be done to accurately measure cost recovery in each mode in order to be definitive about any relative price distortions, in the Commission's view, this would not be a particularly fruitful exercise. A greater pay-off would come from progressing road pricing reform, which would also have the advantage of addressing any lingering concerns about competitive neutrality.

Box 6 Some critical insights in the 'intermodal story'

- Only a small proportion of the land freight task is contestable between road and rail.
- For many freight tasks, road and rail freight are more complements than substitutes.
- Road freight has an *inherent* advantage over rail in that the burden of fixed and common network costs can be largely shared with passenger transport (the dominant user).
- Because road charges under PAYGO are designed to recover capital spending as it is incurred, users bear the opportunity cost of capital, and there is no subsidy to road freight in aggregate over time.
- *All* government spending on road construction and maintenance is included in the spending base from which heavy vehicle charges are determined (according to the NTC cost allocation template), whereas government contributions to rail generally are not recovered.
- An efficient level of freight externalities will rarely be zero, given community benefits from freight transport and the costs of effecting abatement.

What would happen to rail if road charges were increased?

While it does not appear that higher road charges are justified solely to promote competitive neutrality on major corridors, economic modelling conducted by the Commission suggests that aggregate modal shares would not alter much even if heavy vehicle charges were to increase significantly. Moreover, as shown in figure 5, the small gain in rail's market share comes at the expense of a decline in the size of the market itself, so that rail output actually falls. (However, this does not mean that there would be no efficiency gains from increasing heavy vehicle charges where this is needed for cost recovery.)

The results reflect not only the small share of road user charges in total road freight costs, but also the reality that rail is not a good substitute for road for many types of non-bulk freight. The fact that prices for rail freight on the major inter-capital corridors have decreased relative to road at the same time as road's market share

has increased, adds some weight to this (figure 6). What this means is that taxes on road freight across-the-board have more impact on the overall demand for freight, and thus the size of the market, than on modal shares.

Figure 5 Modal impacts of an increase in road charges
30% non-articulated, 40% articulated

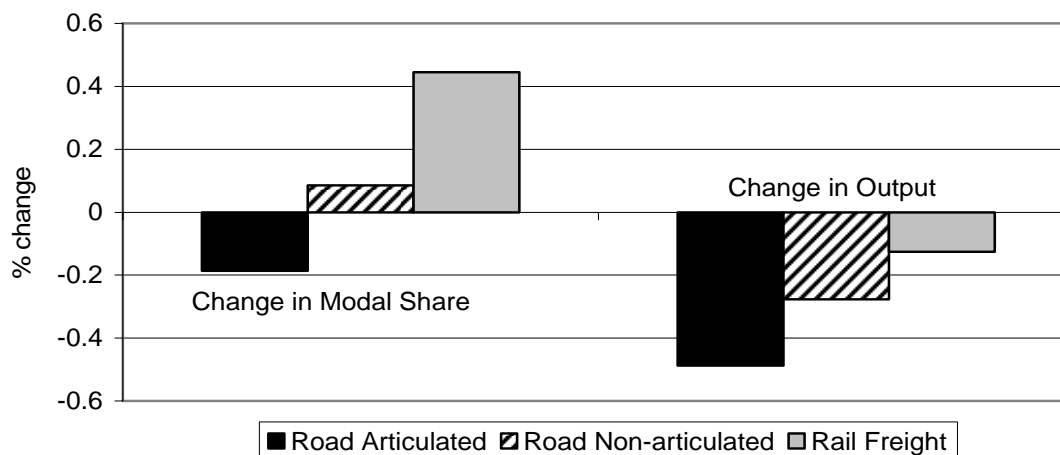
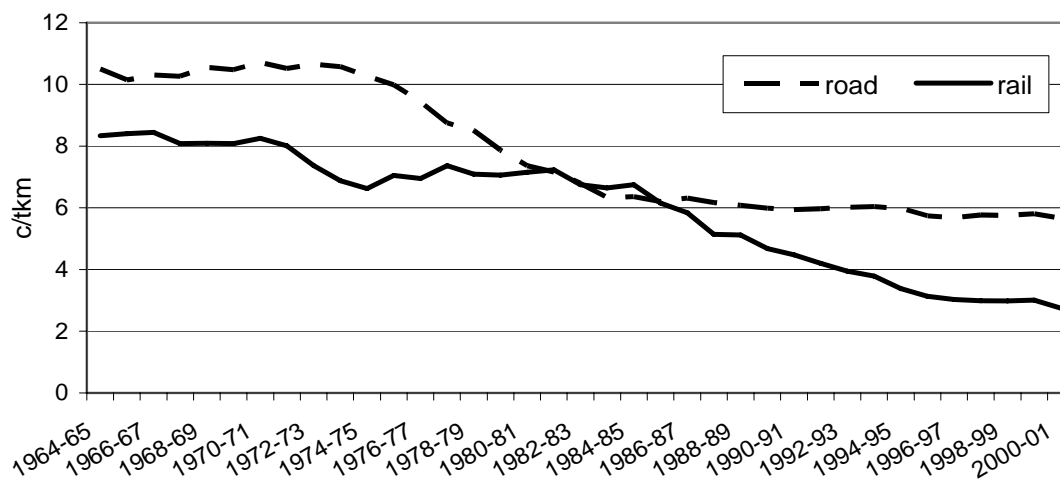


Figure 6 Rail's interstate non-bulk rates have fallen more than road's
\$2006



While the aggregate results give a picture of the overall impact of an increase in national heavy vehicle charges, they do not reveal the variations in impacts across different freight markets captured by the model. For example, on interstate corridors carrying commodities (such as some foods, textiles and other manufactured goods) with higher road–rail cross-price elasticities, there would be a greater modal shift than for the freight market as a whole.

The simulations reported here assume that rail responds to an increase in road prices by expanding output rather than increasing charges. Where rail infrastructure charges and revenue currently do not cover the long-run costs of providing services, it might be appropriate for rail prices to increase in line with road prices. While this would leave modal shares unchanged, rail would be better positioned to maintain service levels with reduced levels of government support. Alternatively, if government support were not withdrawn, increased revenues could be invested to improve service quality with a view to increasing market share (provided the necessary additional charges for improved service levels were not too high).

But there are good reasons for reforming road pricing

Although the Commission has found that road user charges are unlikely to be significantly distorting intermodal choices on major corridors, current charging and provision arrangements for road have some major shortcomings:

- network average charges under PAYGO (which are more akin to taxes) convey negligible signals to road users about the costs of them using particular roads, or to infrastructure providers about the demand for different roads;
- the ‘disconnect’ between road charges and future road spending can lead to inefficient decisions, including holding back efficient road projects, and encourage public sector road providers to ‘preserve’ road assets; and
- government provision of road infrastructure is unlikely to provide an incentive framework for providing road infrastructure services efficiently.

Moreover, unlike rail (and indeed any other infrastructure services), charges for road use are essentially politically determined, requiring ‘sign off’ by nine Ministers. This is not only cumbersome, it creates a fertile environment for lobbying and second-guessing which is inimical to achieving appropriate outcomes.

The available evidence, though not systematic, is consistent with potentially significant underspending and misallocation of investment. The deficiencies of current charging arrangements will be magnified with the projected doubling of national freight demand over the next 20 years.

A way forward for road reform

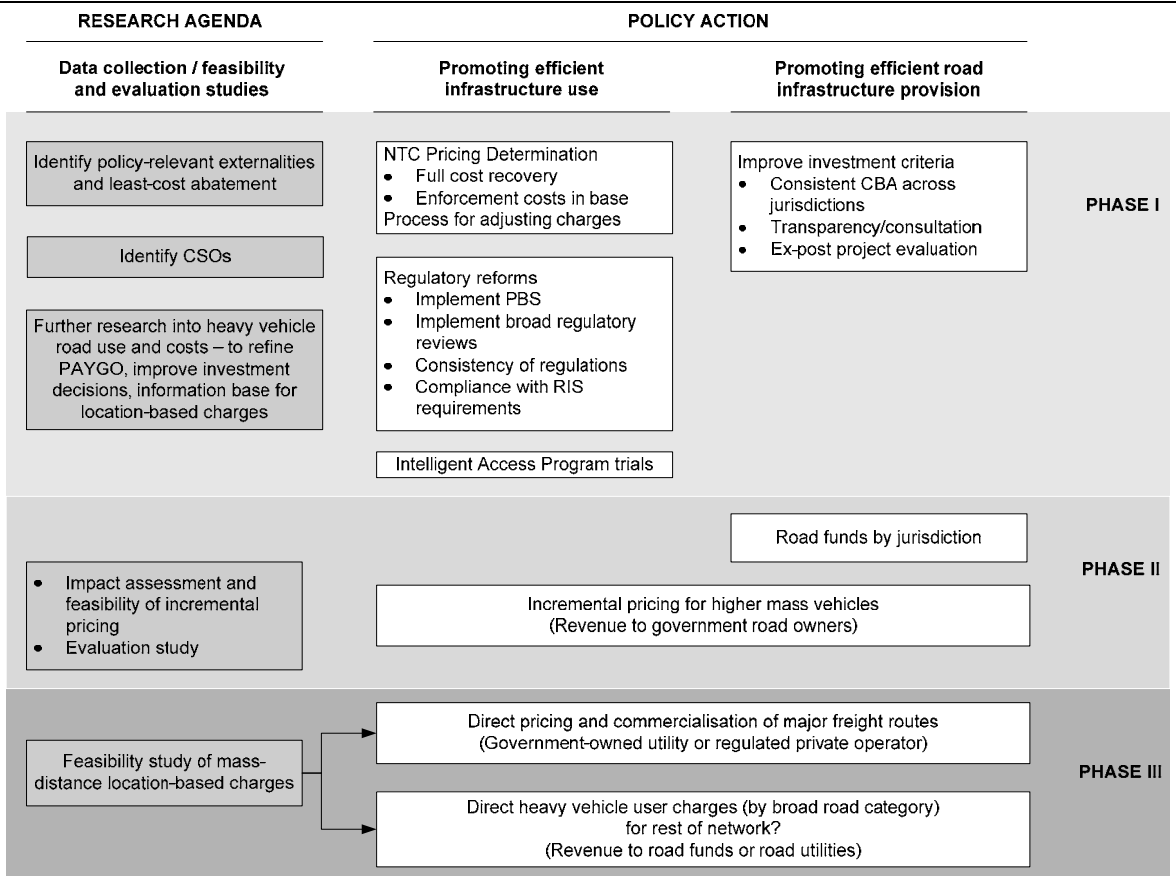
Road user pricing differentiated by location, coupled with more commercially-oriented provision of road infrastructure, have the potential to address these shortcomings and offer the prospect of significant efficiency gains. The potential benefits are those that have driven corporatisation and privatisation of other utilities

— lower-cost, more innovative and customer-focused service provision, and more efficient investment.

But there are many issues, including potential adjustment impacts, that need to be worked through before the net benefits of moving from the current political/administrative model towards more commercially determined road pricing and provision can be demonstrated. Although responses to the Discussion Draft have assisted the Commission in setting broad directions for reform, continuing uncertainties in relation to a range of matters mean that a phased approach will be required to assess costs, benefits and distributional impacts, as well as to trial pricing systems.

The Commission’s recommended agenda for policy reform and further research is summarised in figure 7. Given its importance to the wider economy, this agenda should be overseen and guided by COAG. Three phases are proposed.

Figure 7 A forward agenda for road reform



Phase 1: Improve current arrangements and build a base for change

There are a number of policy actions that can be implemented within current institutional pricing frameworks. They include:

- *Improvements to PAYGO*, including a new determination to address the emerging under-recovery of total heavy vehicle road costs and instituting processes to help ensure maintenance of aggregate cost recovery over time.
- *Increased transparency of CSOs* to facilitate their exclusion from the costs to be recovered through heavy vehicle charges.
- *Improved regulation of heavy vehicles*, to yield productivity gains and allow further innovation by replacing prescriptive regulations with a performance-based approach.
- *Better investment decision-making processes*, with the potential for large efficiency gains from consistent application of the AusLink principles across jurisdictions.

Together, these reforms could generate significant benefits for the road sector and the economy. Drawing on a range of studies that estimate the potential productivity gains from such reforms, the Commission has modelled an indicative 5 per cent productivity improvement in the road freight transport sector. This would lead to an increase in GDP of some \$2.4 billion.

Nevertheless, deficiencies would remain — principally, the lack of price signals to bring about efficient infrastructure use and provision. The Commission is therefore recommending several strands of research and trials in the first phase that would allow some refinement of the PAYGO system and, more importantly, build an information base for implementing direct road user charges. These tasks include more accurately estimating the costs of trucks using different types of road, and identifying and evaluating CSO funding of roads.

Given the growing freight task, it is also important that external costs are addressed in the most efficient manner. There is a particular need for further research into the nature and size of transport externalities and of the extent to which these externalities have already been internalised, in seeking least-cost means of achieving efficient levels of externalities.

Phase 2: Trial and evaluate direct road user charges and link road revenues to road providers

There are two main pricing reform options: mass–distance charges (requiring the monitoring of total distance travelled over a defined time period) and mass–distance *location*-based charges (which would track vehicle use of particular roads and, desirably, actual vehicle mass) (box 7).

While pricing technology can be expected to improve further and become less expensive over time, the technical feasibility of more finely-tuned road user charges is a necessary, but not sufficient, condition for them to be economically worthwhile. In particular, the potential net benefits of direct road user charging will be influenced heavily by the institutional setting within which such charging operates, as much as by the implementation, administration and enforcement costs of the pricing system.

Given the significant costs of implementing a distance-charging system and the ambiguous efficiency impacts, in the Commission’s view it would make more sense to focus on implementing location-based charges. The main efficiency benefits would come from improved signals to road *users* about the incremental costs their road use imposes and to road *providers* about the demand for road capacity and quality, potentially leading to more efficient road provision. By linking revenues to road owners, location-based charging also would promote funding certainty and open up the prospect of commercially-oriented provision of roads.

Box 7 What are mass–distance and location-based charges?

Mass–distance charges

In its simplest form, mass–distance charging would involve measurement of the distance travelled by trucks over a defined period. Technologies for monitoring distance include on-board units (OBUs) — such as odometers or hubodometers — distance licence systems, or toll stations at the entrances and exits of particular roads.

Distance-based charges would continue to be based on network-wide costs, but would overcome the limitations of the combination of fuel excise and registration fees.

- By replacing both the diesel fuel excise and registration fees to some extent, and by reducing the need for averaging of costs within truck classes, distance charges would reduce the burden on heavy vehicles which travel shorter distances each year, including many ancillary truck operations.
- But monitoring distance alone would not allow differentiation of charges according to use of particular roads by particular trucks or truck classes and, for this reason, the efficiency impact of distance-based charging is ambiguous.

Mass–distance location-based charges

Location monitoring would allow heavy vehicle charges to vary by road type. They could also incorporate time-related, location-specific congestion costs as well as varying charges according to actual vehicle mass. They could also, in some cases, enable better targeting of localised externalities.

The monitoring of a vehicle’s location could be achieved using tolling stations, communications beacons, driver logs and OBUs, including Global Positioning System (GPS) technology. Driver logs and/or GPS systems could be cross checked by randomly-placed beacons or cameras. Telematics could be used to collect charges, possibly in real time, in a manner similar to current e-Tolling arrangements. Location-based charging would require accurate mapping and classification of the road system.

Mass–distance location-based charges would allow variable charges to reflect the short- or long-run marginal costs of using particular roads or road types, with an access fee (such as an annual registration fee or other charges) to make an appropriate contribution to network-wide capital costs. Alternatively, location-based charges could be calculated on a ‘stand-alone’ basis, facilitating commercial road provision. In addition to more accurate pricing signals, revenues from location-based charges could flow directly to the relevant road owner, promoting funding certainty and forward-looking charges based on economic costs.

An incremental pricing scheme

Given potentially pronounced distributional implications and a range of implementation issues, the Commission sees considerable advantages in commencing pricing reform through an ‘incremental’ approach that would allow

high-mass vehicles, on a voluntary basis, to pay extra charges to allow them to use parts of the network from which they are currently excluded.

Box 8 'Incremental' pricing

The Intelligent Access Program (IAP) provides a basis for introducing location-based charging for heavy vehicles that exceed mass limits. Potential efficiency benefits would come from replacing these regulations with 'incremental' pricing, so that high-mass vehicles can opt to pay for the additional maintenance and capital costs they cause. Such an approach, while partial:

- would provide better price and investment signals and build a direct link between road user charges and revenues received by road providers for some use of the road network; and
- has the attraction of being voluntary, and trucking operators who expect to benefit would willingly participate.

Because it is partial, involving a mix of whole-of-network and road-specific charging for use of a particular road, this approach creates interface issues that would require resolution.

Initially at least, the system could coexist with PAYGO, avoiding the adjustment impacts involved in dismantling network averaging. It would offer benefits in terms of price and investment signals and, especially, facilitate more efficient transport operations by allowing the relaxation of mass limits. And it would provide an opportunity to test electronic monitoring and, eventually, billing technologies.

Connecting revenues to providers: road funds

Participants representing a wide range of interests concurred that the disconnect between road charges and road spending decisions was a major problem, leading to inefficient investment and maintenance decisions. Several jurisdictions already hypothecate their road charges to road spending. However, in itself, hypothecation need not bring about efficient road spending — the crucial ingredient is ensuring that charges and spending decisions are efficiently determined.

Road funds, which involve devolution of responsibility for management and funding of roads to an autonomous fund manager/agency, can provide an institutional framework for achieving this, with forward-looking charges set to reflect the costs of providing efficient infrastructure, and greater transparency in project evaluation. Whether these benefits are realised, largely depends on the governance of the fund. Transparency and other mechanisms to preserve

independence, and to ensure application of consistent investment criteria, would be essential.

A single national road fund, however, would face significant hurdles in a Federal system that jurisdictionally-based funds would avoid. Moreover, unlike a nation-wide fund, jurisdictional funds would be consistent with the introduction of location-based charges, because revenues could accrue directly to road owners via the funds. At the Commonwealth level, a fund could be established to allocate monies for national highways and major arterial roads currently falling under the AusLink banner, initially with heavy vehicle diesel excise accruing to it.

Phase 3: 'Closing the circle': location-based charges and more commercially-oriented road provision

Although incremental pricing could provide valuable information about the economic feasibility of location-based pricing systems, and build acceptance of these technologies among truck operators, extension of location-based charges to the entire PAYGO base could not be undertaken on a voluntary basis. More fundamentally, any extension of direct road pricing would require thorough feasibility studies to assess the impacts and net benefits of specific options, drawing on lessons that emerge from incremental pricing.

One option would be to limit location-based charges to specific parts of the network such as major freight routes (while continuing to 'tax' freight operators' use of other parts).

Direct user pricing of major freight routes would also allow for commercially-oriented road management. This could bring significant additional efficiency benefits by promoting optimal maintenance and pavement durability, and by encouraging more innovative responses to user demand (such as guaranteeing travel times and providing safety features).

But progressing this option requires the successful management of a number of implementation issues which are far from trivial and which, if not appropriately dealt with, would affect both community acceptance and the economic pay-offs. These include how charges for designated freight routes would mesh with rest-of-network charges, and how non-freight users (particularly passenger traffic) would be charged.

Finally, commercial management of major freight routes would not preclude the introduction of location-based charges for heavy vehicles across the remainder of the network if it could be demonstrated that the benefits of doing so outweighed the

costs. Revenues could flow directly into government road funds established within each jurisdiction.

A way forward for rail

A number of impediments constrain rail's performance. In part they are the legacy of a century of inconsistent State-based regulation, but also include issues arising from the comparatively recent structural separation and commercialisation of rail networks and accompanying access regimes.

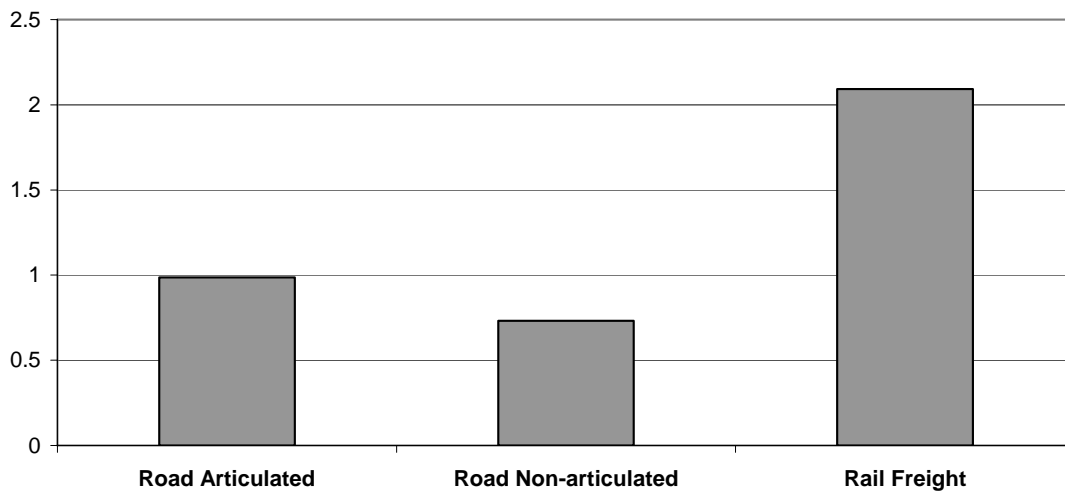
- On the regulatory front, there are several worthwhile initiatives underway aimed at streamlining incompatible or duplicative regulations, especially safety regulations. Reforms in this area have significant potential to reduce rail freight costs, particularly on interstate corridors, and should be implemented as soon as possible.
- Vertical separation and access regulation, designed to encourage above-rail competition, can constrain scope for efficient price discrimination across users and impede efficient investment, potentially reducing the long-run viability of some lines. While COAG's decision to promote national consistency and coordination in rail access regimes is a welcome advance, the Commission considers that there is scope to wind back access regulation where vertically-separated below-rail operators face strong competition from road (or, indeed, sea) freight. Nor should efficient price discrimination by below-rail operators be discouraged. Given the mixed success of vertical separation in encouraging above-rail competition, there should be an independent examination of whether allowing vertical reintegration of those rail lines or networks which face strong intermodal competition would promote their commercial viability.

Stricter application of the corporatisation model to government-owned railways is also needed to improve their performance. Priorities include greater clarification and transparency of objectives, improved transparency of the external governance role of ministers, and a general strengthening of accountability. Achieving a stronger commercial focus also requires that any CSOs that private operators may be required to provide are funded directly and transparently by governments, with objectives clearly enunciated.

In the Commission's assessment, regulatory reforms would have a more beneficial impact on rail's freight share and volumes than even substantial increases in road charges. Commission modelling suggests that rail freight expands at least as much as, if not more than, road following equal productivity improvements in each. This is partly because freight carried by rail can be expanded at relatively low cost, and

also because rail carries more export commodities, which respond strongly to lower freight prices.

Figure 8 Equal productivity improvements give rail freight an edge
5% productivity improvements, % change freight



Steering the reform agenda

That heavy vehicle charges are estimated based on network-wide spending, rather than reflecting the economic cost of road services actually consumed, is neither deliberate nor accidental — until recently, there has been no alternative.

Flawed as these charges are, however, there is not a compelling case for change solely on competitive neutrality grounds.

But there is a compelling case for change for other reasons. The anticipated doubling of the freight task over the next two decades makes it vital that land transport systems can operate as efficiently as possible. Yet road infrastructure continues to be provided by government, with highly-averaged charges being politically determined and far removed from prices that could convey useful market signals.

Technological developments in recent years have created the opportunity to develop a new approach to charging for and providing road services. The challenge is to match the aspiration for a more efficient, commercially-oriented approach to road pricing and provision with implementable, low-cost solutions that yield unambiguous gains and which are broadly acceptable to the community. To this end, the Commission has set out a policy and work agenda for improving the

efficiency of road infrastructure provision and use, including progressing towards direct user charges for heavy vehicles, over the next decade.

Rail has already undertaken significant reforms, but the legacy of a century of inconsistent State-based regulation continues to impede its performance. Broadly-based benefits would accrue from addressing a range of regulatory impediments to that industry's performance, as well as stricter application of corporatisation principles and transparent funding of CSOs. There also is scope to moderate rail access regulation, as well as a need to investigate whether allowing vertical re-integration of some networks would promote their long-term viability.

Given the importance of these reforms for the wider economy, their implementation should be overseen by COAG. The Commission considers that this would be best advanced through the appointment of a special taskforce of officials and experts who would be tasked with reporting back to COAG with detailed findings and implementation plans. More broadly, subject to COAG agreement on effective governance and monitoring arrangements, the Commission sees advantages in embedding the reform process for road and rail freight within the wider National Reform Agenda architecture.