NEW SOUTH WALES GOVERNMENT SUBMISSION

TO

THE PRODUCTIVITY COMMISSION REVIEW OF ECONOMIC COSTS OF FREIGHT INFRASTRUCTURE AND EFFICIENT APPROACHES TO TRANSPORT PRICING

JUNE 2006

REVIEW OF ECONOMIC COSTS OF FREIGHT INFRASTRUCTURE AND EFFICIENT APPROACHES TO TRANSPORT PRICING

Introduction

The NSW Government welcomes this opportunity to make a submission to the Productivity Commission's Review of the Economic Costs of Freight Infrastructure and Efficient Approaches to Transport Pricing.

A significant part of Australia's land transport task resides, and will continue to reside, in NSW. However, current pricing and charging arrangements, in particular for roads, do not adequately reflect the full cost of providing infrastructure or return revenues that reflect the impact of freight transport in NSW.

The NSW Government recognises that, as a general principle, cost reflective pricing maximises economic efficiency. It is noted that, given the relatively small size of the contestable road-rail freight market, it cannot be automatically assumed that a move to more efficient pricing of transport infrastructure will in itself lead to significant modal shifts.

The "correct" pricing should ensure that expenditure on freight transport infrastructure is both appropriate and effectively targeted. A more robust and transparent pricing mechanism for road and rail freight infrastructure would also allow a clearer relationship between pricing, revenue and investment.

There is significant potential to use technologies to more accurately monitor activity and thereby enable the costs of infrastructure use to be allocated appropriately. Advances in telematics now mean that it is possible to consider mass-distance based charging regimes as a way to address these issues.

In addition to technical arguments in relation to pricing, it should be recognised that effective transport pricing requires an effective transport policy framework. The "appropriateness" of pricing arrangements needs to be measured against clear strategic policy objectives. At a national level, despite the development of *AusLink,* clear strategic objectives for the freight transport sector remain under-developed, risking the effectiveness of any potential pricing reform.

This submission provides an overview of NSW's freight task and current charging arrangements, and outlines issues that the Commission should take into account in developing principles for infrastructure pricing. The submission also addresses specific questions raised by the Commission in relation to the measurement/recognition of "economic" costs, and technologies for pricing of freight infrastructure.

The NSW Government acknowledges that the Commission's Review will identify potentially significant transitional or distributional impacts as a consequence of pricing reforms, and will consider these impacts in recommending implementation arrangements.

1. BACKGROUND - NEW SOUTH WALES' SHARE OF THE NATIONAL FREIGHT TASK

The freight sector contributes around 5 per cent of GDP to the Australian economy. As an indicator of the economy's dependence on freight, Australia is estimated to have a ratio of freight tonne-kilometres to GDP more than three times the OECD average (National Transport Commission (NTC) 2000). The freight task is projected to double in the next 20 years, increasing its importance to the national economy.

As shown below, a significant part of Australia's land transport freight task resides, and will continue to reside, in NSW due in part to the high proportion of interstate "into and/or through" freight traffic in NSW. There are commensurate direct impacts on NSW land transport infrastructure, in particular NSW roads.

Sydney and Melbourne also have the most significant intra-urban freight task of all capital cities, reflecting their predominant economic positions and the consumer demand-driven freight requirement. The metropolitan freight requirement presents particular challenges in meeting forecast growth because transport infrastructure is not only for freight use, land is limited, and there are specific costs and constraints created by congestion.

The challenge for the Inquiry is to ensure that "correct" pricing results in expenditure on freight transport infrastructure that is both appropriate and effectively targeted and that the revenue generated for each jurisdiction reflects the impact of freight transport on that jurisdiction. The current pricing and funding arrangements do not provide these outcomes.

Current situation

In 2001 (most recent estimates available), the total Australian rail freight task was 84.59 billion tonne-kilometres (BTK), of which NSW's share was 20.68 BTK (24.4 per cent). Queensland and NSW accounted for almost three-quarters of the total rail freight task in 2001.

Almost three-quarters of Australian road freight by total tonnes carried is transported on NSW, Victorian and Queensland roads. In 2006, NSW alone is estimated to account for 33.6 per cent or 59.7 BTK of the total road freight task (177.53BTK). The magnitude of the road task, in particular, reflects NSW's significance to the Australian economy (comprising 34.3 per cent of Australian GDP) as well as reliance on NSW infrastructure as the predominant "through" State in relation to interstate journeys.

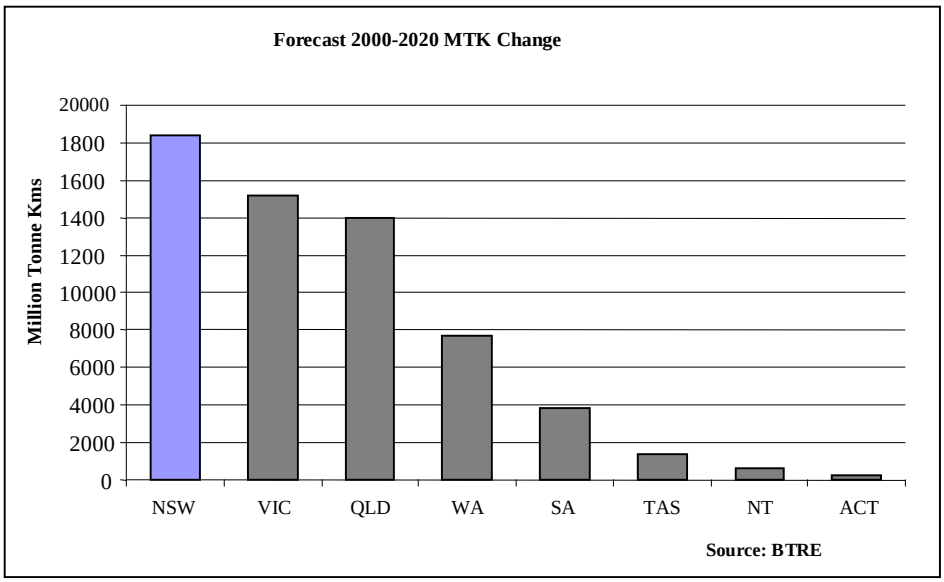
The 2001 ABS Freight Movements Survey indicated that approximately half of all road freight movements in Australia, measured in tonne-kilometres, was interstate road freight. Approximately half of all road freight in Australia and three quarters of all interstate road freight in Australia, measured in tonne-kilometres, moved through NSW for at least part of its journey.

NSW has the most long-established road infrastructure network in the country. As such, the impact of road freight transport (e.g. maintenance requirements) is greatest in NSW. A graphical representation of the present impact of road freight on NSW is attached at Appendix A

Forecasts

NSW is forecast to experience the highest increase in freight tonne kilometres performed to 2020, accounting for around 30 per cent of the total increase in Australia (Chart 1).

Chart 1



Freight carried by both road and rail is projected to increase significantly to meet the growing freight task. While projections for modal share differ according to assumptions about trends in costs and prices, forecasts appear to conclude that most of the growth will be on road (NTC, 2006). Bureau of Transport and Regional Economics (BTRE) projections at 2020 show this growth will result in an increased concentration of total road flows on the East Coast, and particularly in and through NSW (Figures 1 and 2) (BTRE (2), 2006).

Figure 1 – 2001 Total Road Flows

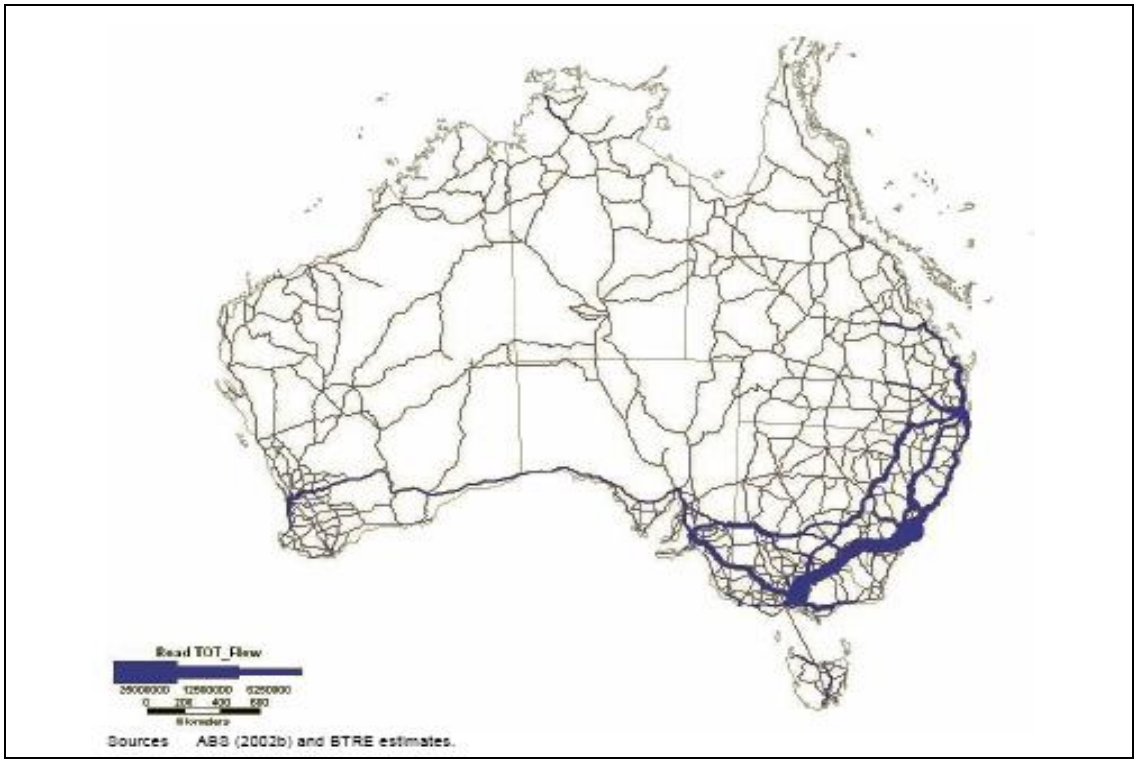
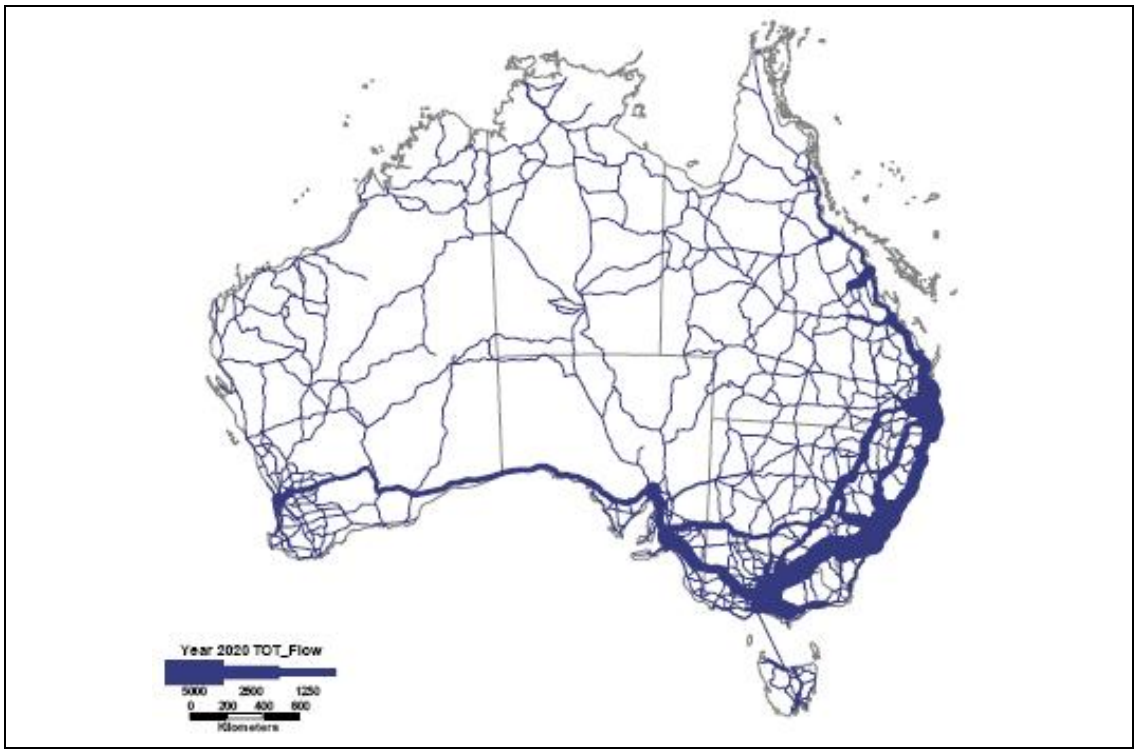


Figure 2 – 2020 Projected Total Road Flows



The inter-capital non-bulk freight task is also projected to grow rapidly. The Brisbane/Melbourne/Sydney triangle accounts for around two-thirds of national demand for inter-capital non-bulk freight (DOTARS, 2005) (Chart 2).

Chart 2 – Inter-capital Non-bulk Freight (Volume)

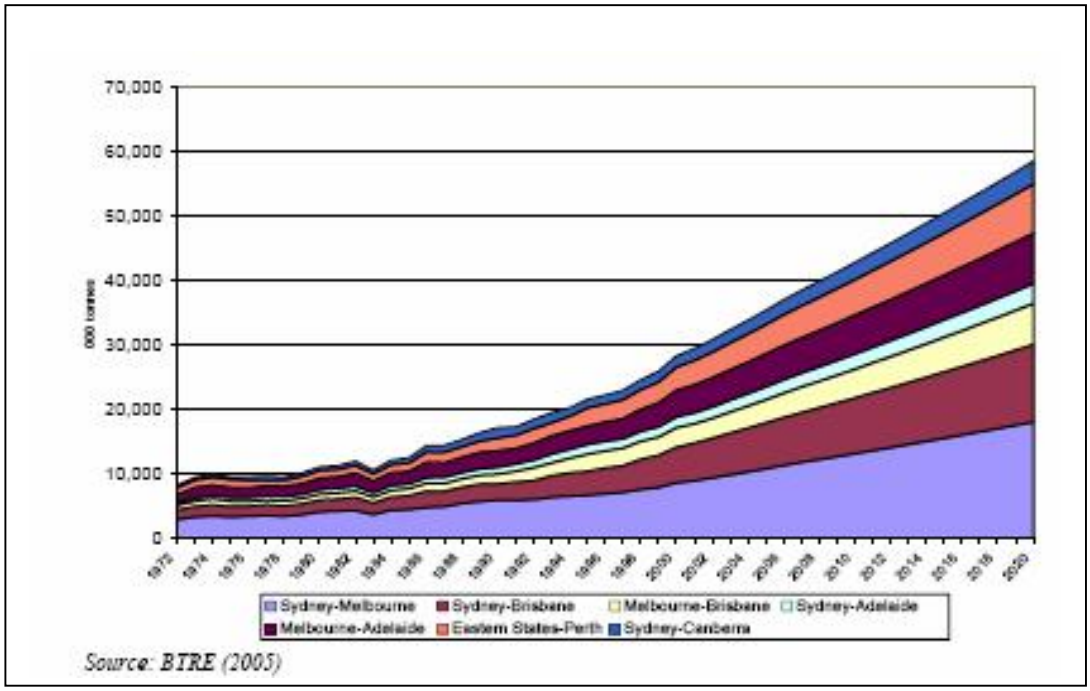
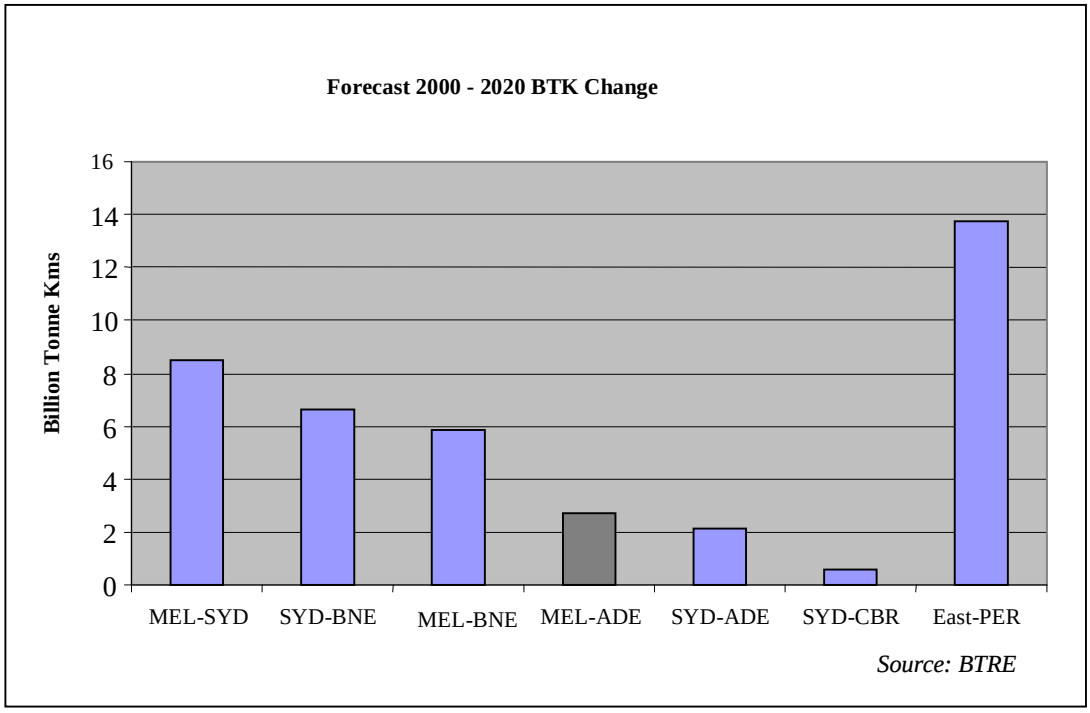


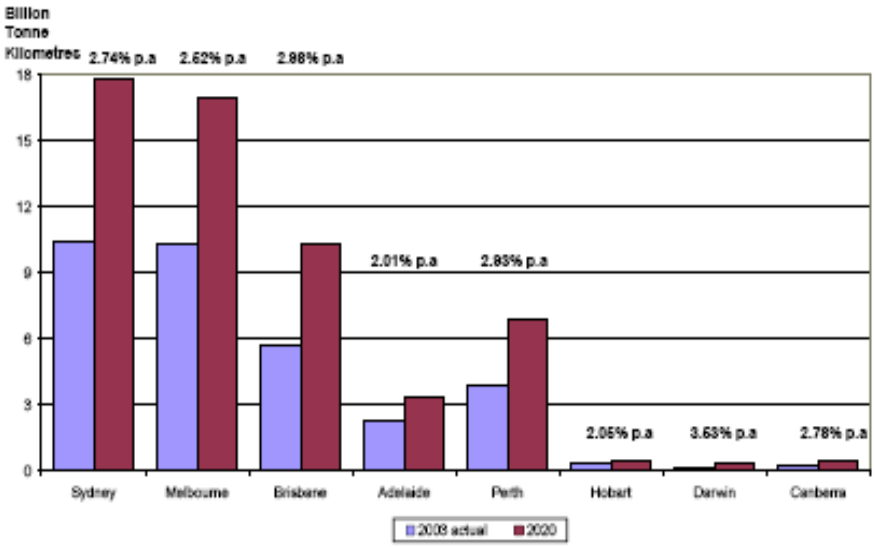
Chart 3 shows the forecast change in BTK on the seven major inter-capital transport corridors. NSW/Sydney features in all but the Melbourne to Adelaide route.

Chart 3



Sydney and Melbourne presently have the most significant urban freight task of all capital cities and are forecast to dominate the urban freight requirement (Chart 4). Sydney is expected to experience amongst the highest increases in tonne kilometres performed to 2020 of all capital cities, and will account for around 32 per cent of the total increase in within-city freight movement in Australia (NTC, 2005).

Chart 4 – Current and Forecast Urban Freight Task



Source: NTC

NSW Commodity Movements

The total estimated annual bulk production of primary products in NSW by region is shown in Table 1. Agriculture and forestry loads are expected to largely remain steady. Significant increases are projected in coal and copper production. Detailed information on commodity production in NSW by statistical region is provided in Appendix B.

Table 1: Total Estimated Annual Production of Primary Industry Products by region

Region	2001 (Agric) and 2005 (Minerals and Forestry) levels					current	trend	Forecast 2010
	Crops and animal products	Agricultural Inputs	Livestock	Minerals	Forest products	total product (tonnes)		
Central West SD	2,667,100	401,600	264,000	8,442,500	929,000	12,704,200	no change	12,600,000
Far West SD	55,700	8,900	49,000	562,500		676,100	no change	650,000
Hunter SD	392,300	62,500	307,100	94,200,000	106,000	95,067,900	incr. coal	105,000,000
Illawarra SD	169,000	19,400	24,200	10,100,000		10,312,600	no change	10,350,000
Mid-North Coast SD	935,100	43,900	77,100		587,000	1,643,100	no change	1,650,000
Murray SD	3,457,000	516,200	276,000		28,000	4,277,200	no change	4,200,000
Murrumbidgee SD	4,405,400	567,200	231,000		1,631,000	6,834,600	no change	6,850,000
North Western SD	2,231,600	235,100	306,200	9,155,000	279,000	12,206,900	incr.copper	12,300,000
Northern SD	2,828,600	383,500	506,200	1,773,000	120,000	5,611,300	no change	5,500,000
Richmond-Tweed SD	1,378,500	33,800	89,500		125,000	1,626,800	no change	1,650,000
South Eastern SD	637,800	201,100	233,700	6,600,000	881,000	8,553,600	no change	8,500,000
Sydney SD	130,500	10,600	165,600	10,200,000		10,506,700	no change	10,500,300
NSW	19,289,100	2,484,100	2,529,600	141,033,000	4,689,000	170,021,000		179,750,300

Source: ABS, NSW Department of Primary Industries

Currently, the majority, if not all, of coal and metal production, and most grain production once it has been consolidated at silos, is moved by rail. The NSW has committed an additional $70 million to the 11 operational grain lines since 2004-05. This includes $30 million over the next two years. All other commodities, including quarry output, are predominantly transported by road. The high proportion of commodities moved by road reflects patterns of commodity movement nationally.

Local transport of goods from the primary point of production to a consolidation/processing facility (grain silo, timber mill, sugar mill, wool buyer, cotton, gin etc) is mainly by road and transported in bulk to metropolitan areas and ports by either road or rail.

The impact of the post-harvest transport task is most significant on the road networks of the NSW grain belt, from the Riverina up through the centre of NSW to the Queensland border, in the main forest areas of the south eastern and south western slopes, and in the sugar cane production area in the far north east of NSW.

Freight to and from major NSW ports

Sydney/Port Botany

Port Botany and Sydney Harbour handle container trade, bulk liquid, motor vehicles and general cargo. Some 27 per cent of Australian containerised imports arrive though Port Botany before they are transported to other locations, principally in metropolitan Sydney. Metropolitan Sydney is the origin or destination for approximately 90 per cent of all NSW non-bulk port freight, with the balance to and from regional NSW.

In 2004-05, Port Botany handled almost 1.4 million twenty foot equivalent units (TEU) of container trade. Rail transported around 20 per cent of containers to and from the Port. Forecasts indicate container freight throughout the greater Sydney area over the next 20 years will more than double from 1.4 million TEUS currently to 3.1 million TEUS, on the assumption that growth will continue at rates of between 5-7% per annum.

Road dominates Sydney's freight task. In 2000–01, road comprised 85.8 per cent of the total Sydney metropolitan freight task of 347,924 kilo tonnes.

Port of Newcastle

The Port of Newcastle is the second largest coal export port in the world, and also handles bulk cargo including grain. Table 2 below shows trade handled entirely or predominately (>95 per cent) by rail. Coal produced in the Hunter Region dominates NSW's bulk commodity transport task.

Trade handled predominantly by road is estimated to comprise around 3.83 million tonnes of total trade in 2005-06 (4 per cent) and includes: alumina, aluminium, fertilisers, steel and woodchips. The proportion of trade handled by road to rail is projected to remain steady.

Table 2 - Trade handled entirely or predominately (>95 per cent) by rail

Commodity	2005-06 Forecast (Million tonnes)	2006-07 Forecast (Million tonnes)	2007-08 Forecast (Million tonnes)	2008-09 Forecast (Million tonnes)
Coal	82.50	86.00	89.00	91.50
Wheat	1.71	1.37	1.14	1.14
Concentrates	0.34	0.41	0.45	0.46

Source: NSW Maritime

Port Kembla

Port Kembla is Australia's leading port for steel exports and second largest for grain. Table 3 below shows trade handled at Port Kembla in 2004-05.

Under the *NSW Ports Growth Plan*, October 2003 (Attachment 1), containers, general cargo and motor vehicle stevedoring from Port Jackson are being encouraged to relocate to Port Kembla as existing leases expire. By 2008, Port Kembla's freight task is anticipated to increase by approximately 270,000 motor vehicles and approximately 30,000 containers following the relocation of trade.

Table 3 – Port Kembla Trade 2004-05

Commodity	Road (Million tonnes)	Rail (Million Tonnes)
Coal	4.0	6.6
Grain	0	1.0
Other	0.5	0.6

Source: NSW Maritime

Appendix B provides further detail of projections by commodity and Port.

2. ISSUES AND PRINCIPLES FOR PRICING REFORM

The projected growth in size of the freight task requires that the freight task be more efficiently managed, and that pricing and investment strategies for land transport infrastructure be more accurately aligned with supply and demand. In-principle, efficient pricing of road and rail freight infrastructure should be set through consistent and competitively neutral pricing regimes, in a manner that optimises efficiency and productivity in the transport task and maximises net benefits to the community. NSW notes the following issues which should be taken into account by the Productivity Commission in developing recommended principles for infrastructure pricing.

2.1 Need for nationally-agreed objectives for the freight sector

Pricing is only one, albeit critical, element of the "right" policy environment required to support efficient transport infrastructure development and use. This, in turn, pre-supposes that there are nationally-agreed objectives for the freight sector which are the basis of decisions on the mix of policy measures necessary in the short and longer terms to meet the challenges of the growing freight task and to ensure sustainable outcomes for the community.

The NSW Government has previously made submissions to the Commonwealth during negotiations on its *Auslink* bilateral agreement on the need for specific objectives to guide future land transport infrastructure planning and investment (as well as clear principles on issues which will affect how well these objectives are carried out, such as the operation of the new premise of "shared responsibility" for funding of infrastructure by governments). The current goals under *AusLink* are insufficient to guide the direction of freight sector reform. Resolution of these issues remains a priority for NSW in the negotiation of any future *AusLink* agreement with the Commonwealth.

Given the importance of a strategic policy framework in providing both direction to, and measuring the effectiveness of, pricing reform, setting clear, agreed national objectives for transport policy is a priority. NSW notes that the *AusLink* White Paper anticipated the formation of a National Transport Advisory Council (NTAC) to provide advice on the long-term development of the national transport system in three key areas:

- Priorities for national infrastructure investment;
- Reforms to support modal integration;
- Strategies, policies and options for infrastructure pricing.

The proposal for an NTAC was developed in recognition of the need to facilitate consensus in these policy areas within a complex federal system. The envisaged role of NTAC in regards to pricing is of particular pertinence to the current inquiry. While the PC's inquiry is welcome, the "fluidity" of, or ongoing developments in relation to, transport issues raises the need for an ongoing, independent analysis of the links between pricing, strategic priorities and investment. This was to be one of the anticipated roles of NTAC. In the absence of NTAC or a similar mechanism, the objective of meeting strategic policy gaps through *AusLink* will be continue to be hindered.

In addition to its resolution to establish this Inquiry, the Council of Australian Governments' New National Reform Agenda (February 2006) is considering a number of issues that will affect the operation of, and future planning for, the freight sector, including: inter-jurisdictional harmonisation and reform of road and rail freight regulation; economic regulation of significant infrastructure (in particular rail access regimes); the impact of urban congestion on freight corridors; and better planning for transport infrastructure (under the auspices of *AusLink*) and assessment of infrastructure proposals. These reviews are relevant to the Productivity Commission in considering the establishment of an appropriate pricing implementation framework.

2.2 Appropriate and effective targeting of investment in national land transport

Infrastructure provision and use needs to appropriately reflect the nature of the freight task in a given situation, as well as the market and environment in which it operates. This is a significant issue in relation to urban freight, in particular, as detailed below.

The freight transport task is different in congested urban environments. It is difficult and largely unmeaningful to attempt to define/distinguish "freight infrastructure" from the general urban transport network. With the exception of certain dedicated rail freight lines, urban transport infrastructure is shared by both freight and other (non-freight) users. Private vehicles owners, public transport (passenger) service providers and trucks use roads. Freight and passenger trains use much of the same rail track, particularly in Sydney.

The efficiency of urban passenger transport and the efficiency of freight transport on shared-use infrastructure are closely connected. Reform of pricing/infrastructure policies for freight will impact on private road users and public transport passengers, and vice versa.

In this regard, it is noted that NSW's policy is to maintain reasonable priority and certainty of access for railway passenger services on the shared network. Although the freight rail industry has expressed some concerns with this approach in the context of the Commission's current Inquiry, it should be noted that the Sydney metropolitan rail network is overwhelmingly "paid for" through NSW Government funding and from fare revenue from passengers, rather than by freight operators. Government funding for RailCorp for 2005-06 is in the order of $1.6 billion, excluding capital, and fare box revenue from passengers is expected to be in the order of $0.5 billion. The infrastructure maintenance needs of the metropolitan network have been assessed to be in the order of $0.4 billion per annum. In comparison, access charge revenue from rail freight operators is relatively small, at approximately $30 million per annum.

The significant proportion of public funding provided to maintain both the metropolitan and regional rail networks in NSW reflects the "premium" that the NSW Government pays to ensure a reasonable level of certainty for NSW passenger rail services.

That said, the issue of the interaction of passenger and freight transport is important one. The lack of recognition of the close connection between passenger and freight interaction, particularly in metropolitan areas where infrastructure is shared, is a major weakness in current *AusLink* funding arrangements. The Commonwealth's approach to funding under *AusLink* bilateral agreements with States and Territories has generally been to seek to distinguish between "freight" and "passenger" transport tasks. As this distinction cannot easily be made in urban transport networks, important rail and road transport infrastructure in congested metropolitan areas has been excluded from funding.

The result is distortions favouring inter-capital, regional and intrastate long haul movements (where passenger transport issues appear to be of less concern). This approach limits the capacity to manage constraints, diminishing the effectiveness of *AusLink* in delivering transport solutions.

But the challenge of meeting future increases in the freight task is potentially greater for the urban freight task than for long haul freight. The NTC (2005) observed that improvements in productivity in the long-distance haul sector have been achieved in a relatively straight forward way through the more efficient use of assets and vehicles. In contrast, productivity gains in the intra-urban freight task are significantly affected by congestion issues and constraints on existing infrastructure.

Intra-urban freight movements are dominated by short hauls by light commercial vehicles. Nationally, the urban freight task carried by light commercial vehicles is projected to grow from 72 per cent to 83 per cent in 2020 (NTC, 2005). The NTC has noted that urban freight requires "massive movements between thousands of nodes and in all manner of forms" for the purposes of meeting the demand/consumption end of the market (NTC, 2005).

Although rail carries a relatively smaller proportion of the freight task in metropolitan areas, this does not diminish (in fact, it increases) its importance in the carriage of freight to ports and intermodal terminals, and in easing pressure on the road system.

The NSW metropolitan rail system comprises around 1,360 kilometres of electrified track with 18 different above rail operators in the freight and passenger markets supporting around 2,400 RailCorp passenger services per weekday to 304 train stations and approximately 150 freight movements per day. The road network supports an estimated 11 million car trips each working day in the Sydney region. Metropolitan buses travel over 100 million kilometres annually. Public transport enables some 275 million annual rail journeys and 300 million bus journeys, or around 11 per cent of total journeys in the Greater Sydney Region.

Sydney's population is projected to grow by some one million in the next twenty years, an increase that will have serious implications for urban infrastructure and amenity. Unlike other major Australian cities, there is little capacity for Sydney to expand beyond its current natural boundaries.

These features pose significant challenges and costs in meeting demand for infrastructure within a framework of environmental sustainability. Congestion will become an increasingly significant issue for freight operators in the major capital cities. The national cost of congestion is estimated to be $8.8 billion ($1995) by 2015 (BTRE).

Efficient transport infrastructure pricing should assist in moving towards appropriate and effectively targeted increases in the capacity of urban rail infrastructure and roads, and optimum use of transport modes. A further issue for the Inquiry is how prices can better manage the adverse socio-economic costs of the freight transport effort. The particular efficiency and environmental costs of congestion associated with the urban freight task are significant considerations in this regard.

NSW's initiatives to manage Sydney's freight task

Notwithstanding current *AusLink* arrangements, the NSW Government is pursuing major initiatives to ensure that NSW can efficiently and sustainably meet the growing freight task.

The NSW's Government's *Ports Growth Plan* (October 2003) provides an overarching framework within which the Government is working with industry and the community to ensure future growth and development of port capacity in NSW. Key elements of the Plan include:

- The progressive relocation of containers, general cargo and car stevedoring from Port Jackson to Port Kembla as existing leases expire. A $140 million redevelopment program is underway to transform Port Kembla into Australia's leading car import centre. A new cargo facility and third berth will be constructed to enable Port Kembla to handle nearly 240,000 vehicles a year, along with increased containers and general cargo. This will provide a significant economic boost to the area;

- Securing of the former BHP steelworks site at Mayfield, Newcastle, which will become the site of the State's next major container facility when Port Botany reaches capacity, and inviting the development of a smaller multi-purpose terminal in the interim. Newcastle presently has capacity approaching 90 million tonnes per annum. Capacity will increase to 102 million tonnes per annum following modifications to the Port Waratah Coal terminal at Kooragang by 2007. A further 30 million tonnes per annum capacity will be added to the port by 2009 by the development of a third coal terminal on Kooragang Island by a coal industry consortium;

- The expansion of Port Botany to fully utilise its existing capacity prior to shifting trade to Newcastle. The NSW Government has approved a $500 million expansion of facilities at the Port. The expansion may also promote greater competition amongst service providers at the Port; and

- Investigations into the means for increasing the proportion of containers moved by rail to and from the ports to intermodal terminals in both the Sydney metropolitan area and regional NSW.

In December 2004, the Government commissioned the Freight Infrastructure Advisory Board (FIAB), chaired by the Hon. Laurie Brereton, to advise on the most efficient means of increasing the proportion of container freight transported by rail from the current 20 per cent to 40 per cent. The FIAB's July 2005 report (Attachment 2) recommended, amongst other things, the establishment of an expanded transport and container terminal network within Sydney and the adoption of terminal features (size and location) and operational reforms to increase freight transport efficiency and minimise the impact of the freight task on local environment. The FIAB report is under detailed consideration by the NSW Government.

The NSW Government is also investing in and facilitating significant transport infrastructure which both specifically targets freight efficiency and the efficiency of the overall transport system. These include:

- Working with the ARTC to facilitate construction of the Southern Sydney Freight Line, a dedicated freight line between Macarthur and Sefton in southern Sydney which will allow passenger and freight services to operate independently in that sector;

- Enhancing the capacity of the existing Botany Freight Line as part of the expansion of Port facilities.

- Significantly increasing public investment in transport. The total budgeted expenditure on transport in 2006-07 in NSW is $5.1 billion. This is a 4.5 per cent increase on the forecast for 2005-06 and follows an average increase of 10.2 per cent per annum over the period from 2002-03 to 2005-06. The major component of the increase in public transport is for improving the performance of rail services. A major initiative is implementation of a $1.5 billion "Rail Clearways" program to improve the capacity and reliability of services on the Sydney metropolitan rail network. The program is on track to be completed in 2010. The main benefits will accrue to passenger services, but there will also be flow on benefits for freight;

- A mixture of innovation (electronic tolling), new road infrastructure and traffic management, which has resulted in relatively stable average motor vehicle speeds during peak periods across the seven major routes to and from Sydney; and

- More broadly, in 2005 the Government introduced major reforms streamlining infrastructure planning approval requirements, and to provide a clear and predictable environment to support investment in key transport infrastructure. For example, the Government removed a requirement for up to 15 different approvals and licences from nine separate pieces of legislation for major development and infrastructure projects and replaced this with a single assessment and approval system. The NSW Government also introduced "concept approvals" to provide up-front certainty on major projects and thereby reduce proponents' investment risk.

2.3 The "cure" should fit the market failure

Different sectors/situations may require different remedies to address market failure, as illustrated above in relation to the metropolitan/urban transport network. Another example is road and rail interstate networks where, for example, NSW as the predominant "through" State on the East Coast takes both the residual capital and revenue risks on assets.

The strategic and national importance of road and rail freight transport infrastructure gives rise to further considerations which may not be compatible with a uniform cost-recovery based regime. These include: encouraging value-added investment in the national freight transport infrastructure network by all jurisdictions, rather than investment focused on revenue generation; and encouraging access as a means of asset management and utilisation, rather than protecting the asset through restricting access. The focus should be on establishing consistent criteria for price determination across modes.

2.4 Use of prices to optimise inter-modal choice

The main area of competition between rail and road is in interstate non-bulk freight. Interstate non-bulk freight comprised 78.73 BTK or 18.5 per cent of total domestic 430 BTK in 2003. This is a comparatively small market, although it is projected to grow rapidly in absolute terms. Most of the commodities moved along interstate corridors are value-added products for export or interstate construction, rather than raw materials (NTC, 2005).

Given the relatively small size of the contestable road-rail freight market, it cannot be automatically assumed that a move to more efficient pricing of transport infrastructure will in itself lead to significant modal shifts. Where road and rail compete, prices for both modes should be determined taking explicit account of the interdependence in demand between them and of the need to achieve revenue adequacy. The Productivity Commission should take account of existing subsidy and pricing arrangements which may make it difficult to predict the impact of a new pricing regime.

2.5 Effective targeting of public investment in national land transport

In-principle, the subsidisation of any particular vehicle type or operator on the basis of their characteristics, location or activity, should be transparent decisions which are applied after charging the efficient price. Such an approach would provide transparency in the provision of subsidies and could be accommodated through the use of data obtained in the charging of a mass, distance and location-based price.

The "economically correct" level of investment in either rail or road depends on many factors, such as their relative importance in Australia's total transport task (present and predicted), the quality of existing assets, whether the proposed investment would generate a net economic benefit, road and rail users' willingness to pay for the capital investment and the likely rate of return on further investment. Consideration of these factors together would help to determine the balance of public spending on road and rail. Decisions on the amount of expenditure on a road or rail project are also subject to governments' policy priorities overall. This raises again the need for agreed strategic national objectives for the freight network to better guide long-term planning and decision making.

3. COMMENT ON QUESTIONS RAISED IN THE ISSUES PAPER

This section provides information and comment on key issues raised by the Productivity Commission in its Issues Paper.

3.1 Current charging arrangements

The current PAYGO system

PAYGO is a retrospective expenditure recovery model that uses actual cash expenditure on road transport infrastructure by jurisdictions as the basis for determining the level of revenue that should be raised from the heavy vehicle industry. Such expenditure may not represent the full cost of providing that infrastructure, even if the impacts of externalities are not taken into account.

The existing heavy vehicle road pricing regime has taken as its objective a nationally uniform price for heavy vehicles. The result has been NSW implementing lower prices whilst some other States and Territories have increased prices to achieve uniformity. The level of road-related funding distributed to jurisdictions responsible for upkeep and maintenance of the road network does not reflect the magnitude of the task on those networks.

The current road pricing arrangements represent a significant improvement on the arrangements that existed before the 1st Heavy Vehicle Road Pricing Determination. However, there are a number of concerns about the PAYGO system, including that the model:

- lacks the price signals needed to facilitate efficient user choice of transport mode or route;
- imposes the same charge on a particular vehicle, regardless of the part of the network it is operating on, thereby exacerbating the inequities between the price paid, the service received and the wear on the road;
- represents the retrospective recovery of actual cash expenditure incurred rather than the true economic cost of infrastructure provision, maintenance and recapitalisation;
- provides no assessment of the economic merit of the expenditure;
- is heavily dependent upon data, despite limitations to available data and concern about statistical reliability in some cases;
- through the use of a once a year payment of a vehicle registration charge, promotes a lack of transparency at the time of travel choice; and
- does not allocate revenue to where it is generated or to where it is needed.

From an implementation perspective, technical concerns regarding the PAYGO model include:

- the lack of any alternate or comparative methodology, including in overseas practice, to provide a basis for assessing the outcomes of the model;
- the questionable robustness of the model and its methodology given their complexity and the reliance on assumptions, estimates and scenarios, for which little explanation or justification is given, when faced with a lack of reliable data and other deficiencies; and
- the implicit assumption that the considerable difficulties encountered at State level in relation to the accuracy and interpretation of the available data can be overcome through the aggregation of data at the national level. This is particularly relevant in relation to vehicle numbers, distribution, percentage of light and heavy vehicles, number of axles, and equivalent standard axle repetitions.

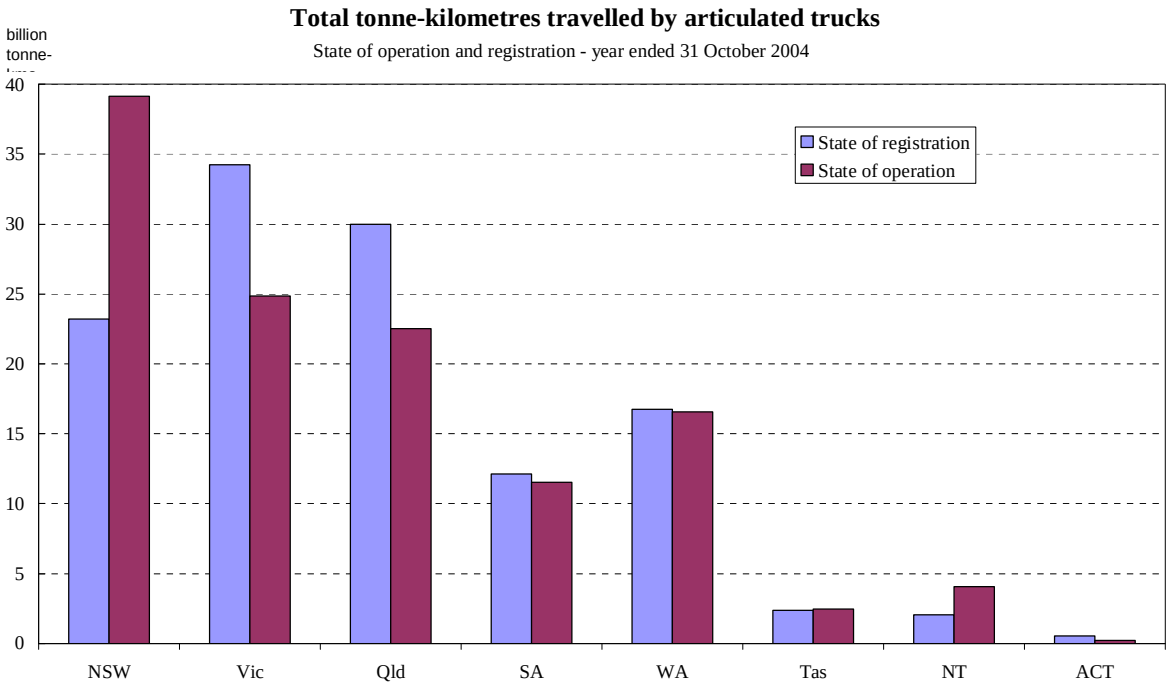
NSW has particular concerns in relation to the application of estimated national averages regarding vehicle type wear rates and route conditions in determining the level of annual charges on different vehicle types. These costs vary dramatically between various regions and road networks depending on the condition and age of the road network. The NSW network is generally older and subject to greater rates of wear and higher usage than those interstate. As such, the national averages significantly disadvantage NSW, reducing the ability of NSW to invest in the modernisation of bridges and pavements to facilitate increases in freight productivity.

Road charges – Vehicle Registration and Fuel Taxes

Current road charges are a two-part price, with the fixed element being registration charges (30 per cent; around $425 million p.a.) and the variable element being the fuel excise (70 percent; around $968 million p.a.).

Heavy vehicle registration charges are paid directly to the jurisdiction that the vehicle is registered in. However, this revenue stream does not reflect the level of activity of all vehicles operating in the State against the level of activity of vehicles registered in that State, as shown by State of operation versus the State of registration for articulated trucks in the 2004 ABS Survey of Motor Vehicle Use (see Chart 5).

Chart 5



By comparison, under the Federal Interstate Registration Scheme (FIRS) for vehicles involved in the inter-State movement of freight, the States collect the registration charges for FIRS vehicles on behalf of the Commonwealth. The Commonwealth allocates this revenue among the States, with the aim of ensuring that the allocation reflects, as far as practical, the distribution of the wear caused to roads by FIRS vehicles. The current proportions used by the Commonwealth for this distribution, which are based on estimates of where FIRS vehicles operate, are contained in Table 5:

Table 5 - Percentage of FIRS revenue allocated to States and Territories

State	Percentage of revenue
New South Wales	46.1
Victoria	26.8
Queensland	9.5
Western Australia	4.0
South Australia	12.1
Tasmania	0.5
Australian Capital Territory	0.5
Northern Territory	0.5
Total	100.0

As advised by the NSW Roads and Traffic Authority

The charges allocated to each vehicle class under PAYGO are adjusted for the amount of fuel excise the vehicles are estimated to pay, based on fuel consumption projections for each class of vehicle. Fuel excise is not efficient as a cost recovery tool as the larger the vehicle, the more wear it will cause, yet the less fuel it will use for the weight moved. Combined with a fixed registration fee, a uniform fuel tax results in a unit road charge which declines with the product of mass carried and distance travelled. Fuel excise is therefore a poor proxy for road wear.

In-principle, corridor-specific prices based on marginal road wear would provide better signals for individual road use decisions. For example, there would be reduced risk that trucks with heaviest axle loads and travelling greatest distances would be under-charged for road wear, an incentive to optimise axle loadings and better informed road pavement investment decisions (BTRE (1), 2006).

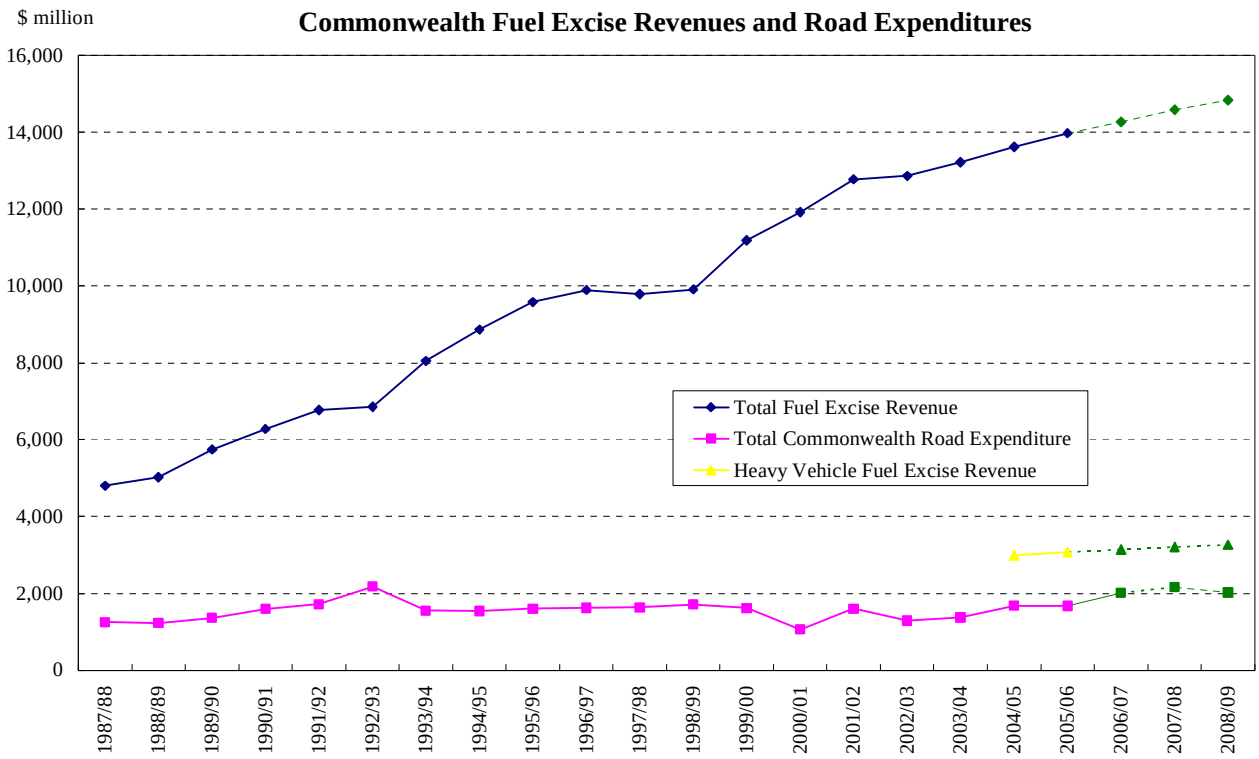
Expenditure versus Revenue

Under the current road freight pricing arrangements, just below 70 per cent of the total heavy vehicle charges for the recovery of the cost of maintaining and providing freight transport infrastructure are collected as Commonwealth diesel fuel excise. However, only a small portion of these revenues are allocated to roads nationally, as indicated by Chart 6 overleaf.

Fuel excise is a Commonwealth tax and revenue raised from this tax is not returned to the States and Territories. Furthermore, Commonwealth funding for roads is directed primarily for the benefit of general road users. As such, there is little relationship between the cost of maintaining freight transport infrastructure, the revenue raised from the freight sector by the fuel excise or the expenditure by the Commonwealth on roads.

The Commission could assist the public policy debate by investigating the relationship between the fuel excise paid by heavy vehicles and the road funding provided by the Commonwealth that can be attributed to heavy vehicle activity.

Chart 6



3.2 Implementation of mass-distance/ location based charging

Advances in road vehicle telematics in recent years now mean that it is possible to consider, for example, mass-distance/location based charging regimes to promote better-informed decisions on investment in infrastructure and individual use.

Telematics technology

The wide-spread adoption and use of in-vehicle telematics technology for the management of vehicles and drivers throughout the road transport sector has the potential to be used for regulatory purposes.

In-vehicle telematics can accurately determine the location and journey details of individual vehicles, and can be used in conjunction with other technology such as on-board mass-management systems to determine both the location and the load of the vehicle simultaneously. A number of trucking companies have already adopted vehicle telematics for sophisticated fleet management, logistics and e-commerce applications in long-haul and urban applications. On-board mass management systems are increasingly being used by road transport operators to better manage their loading practices and as part of mass management accreditation arrangements under the National Heavy Vehicle Accreditation Scheme (NHVAS).

The reduction in the cost and the general availability of technology has led road agencies to consider the potential use of in-vehicle telematics to manage the access and compliance of road freight transport. A number of pilots have been trialled by Australian road agencies with successful results. The use of in-vehicle telematics has the potential to lead further regulatory reforms in road transport that, until now, have not been able to be implemented.

To this end, it should be noted that the National Transport Commission (NTC) is expected to commence a feasibility study into the use of on-board mass management systems for use in conjunction with the Intelligent Access Program (IAP). A key objective of the study is to determine whether on-board mass management systems can meet: (a) a minimum level of evidentiary requirements to record mass/load information for regulatory purposes; and (b) suitable tamper resistance and tamper alert measures. Both of these requirements must be

met before alternative pricing arrangements, using a combination of time, location and loading details, can be seriously considered for wider application. However, comprehensive analysis has revealed that the reliability and accuracy of the technology is sound.

The current availability of this technology provides an opportunity to trial its use in discrete applications to test the practical feasibility and administrative requirements for introducing alternative pricing arrangements for heavy vehicles. The NSW Roads and Traffic Authority would be willing to trial the technology in conjunction with a number of trusted road transport operators for a defined period of time, to evaluate the use of the technology, identify costs and benefits, as well as risks and opportunities, and to report back with comprehensive results. Such a trial could be undertaken either in parallel to or in conjunction with the NTC feasibility study.

NSW is in a strong position to support the trial (and later use) of in-vehicle telematics through its comprehensive suite of on-road compliance systems, including heavy vehicle checking stations and Safe-T-Cam. The use of these systems serves to strengthen any use of in-vehicle telematics, providing a means to verify the reliability and accuracy of time and location reports generated through these systems.

International Experience

In Europe, there are currently three approaches in relation to heavy vehicle charging: 1) the Eurovignette system; 2) tolls on specific roads; and 3) area based charging. Austria also has a quota system for heavy vehicles based on eco points.

The Eurovignette system was adopted in Germany, Belgium, the Netherlands, Luxembourg, Denmark and Sweden in 1996. Charges were introduced to ensure that vehicles entering from outside each country made a fair contribution to the cost of constructing, maintaining and operating the road network. It was particularly aimed at vehicles making a non-stop trip through a foreign country.
The Eurovignette directive was aimed at reducing competition problems in the road freight sector caused by the different methods and levels of charging for infrastructure use in different countries. The Eurovignette is limited to motorways and is only related to the cost of providing those roads, thus excluding external costs. It is based on time (a daily, weekly, monthly or yearly payment), rather than on distance travelled.

France, Spain and Italy already had tolls on their motorways which cover all vehicles and hence did not need to adopt the Eurovignette system. Switzerland introduced a charging scheme for heavy goods vehicles in 2001, which is based on all distance travelled within the country.

Europe is now considering how it might eventually achieve convergence of the different inter-urban road pricing systems that have been adopted, and are currently being implemented, in different countries. Apart from Switzerland, existing and planned inter-urban road pricing schemes in Europe are restricted to motorways. This is because of the existing EU legal framework and possibly also because there is already a degree of acceptance of tolls on some motorways. The European Commission therefore considers that in the short-term, efforts to harmonise heavy vehicle charging systems in Europe should focus on the motorway network, although this does not prevent Member States, under the principle of subsidiarity, from applying infrastructure charging systems on roads which are not part of the main networks.

In 2002, the European Commission released a draft directive on interoperability for electronic fee collection throughout Europe. The directive envisaged implementing a regulatory framework and tools for the deployment of a European electronic fee collection (EFC) service in two stages, heavy goods vehicles and long distance coaches by January 2009, and all vehicles by January 2011.

The adopted framework for the proposed EFC service has the basic principle of a single contract and a single on-board unit for each user, available anywhere on the whole tolled network, capable of handling any toll or tax, and allowing the same quality of service in any country. The proposed solution is for onboard units to be available to all heavy goods vehicles which will support three interfaces GNSS (GPS), GSM (cellular network), and DSRC

(roadside gantries) and for toll transactions in different countries to use one or more of these interfaces depending on the application adopted by that country.

European countries are at various stages in the development of new distance-related charging systems for heavy vehicles. Switzerland introduced a new distance related charging system in 2001. Austria started operation of a new DSRC based system on 1 January 2004. It is understood that the German heavy vehicle charging system met considerable project management problems before commencing successfully in 2005. The Netherlands is considering replacement of the Eurovignette with a GPS type system, similar to that being implemented in Germany. Most of these systems include another important feature, namely the use of third-party (generally private industry) providers to administer the systems and collect the revenue.

3.3 *Marginal cost pricing*

NSW notes that there is broad and continuing debate, both nationally and internationally, on the calculation of the costs of providing and maintaining freight transport infrastructure and the allocation of these costs to the freight transport industry, especially with respect to roads.

NSW supports the full exploration of these issues but notes that there can be significant difficulties in calculating such costs, not least of which concern the long life of the assets concerned, variations in the techniques and materials used in construction, and local environmental conditions.

The characteristics of individual routes, and even individual sections of the same route, will vary depending on the above factors. As such, each route will have different wear and cost characteristics. There is conceptually a basis for applying a different mass-distance based charge on different routes. However, individual route specific pricing would need to be cognisant of the following challenges:

- A considerable increase in the level of complexity in determining the relevant prices for road and rail freight infrastructure;

- An increase in the level of complexity in the different prices faced by freight operators, especially if there is a breakdown in the relationship between the prices charged and the level of service obtained;

- The potential for distortions in investment and route planning by operators if they seek to reduce transport costs rather than increase efficiency;

- Creation of per unit price distortions between routes that provide a similar level of service due to differences in volumes of usage and/or costs of provision; and

- Creation of pricing distortions between jurisdictions for the provision of the same level of service through variations in the: valuation of similar types of road and/or rail routes; allocation of costs attributable to light versus heavy vehicles; and/or allocation of costs between attributable and non-attributable factors (depending on the approach taken in recovering non-attributable costs).

One option for addressing these concerns in the roads area and for congested urban rail networks is the development of access pricing based on, amongst other things, the level of service provided by the route and obtained by the vehicle.

Under the Performance Based Standards (PBS) regime, PBS vehicles are to be classified into four categories based on the level of their performance. Guidelines have been proposed that may enable routes to be assessed against four categories based on the PBS standards. It may be possible to use such categories as a proxy for determining the level of service provided by a route, with a further category representing routes which heavy vehicles do not access. As such, while for the regulatory purposes for which it is intended NSW believes that the PBS regime requires further development, the intention to match trucks to networks is attractive and could be used as a basis for service based charging model.

Classifying road networks into a vertical series of service level based categories would enable prices to be set so that an operator would pay the same price for the same level of service regardless of the part of the network the operator was on. Further price differentiation could be achieved by varying the price depending on the mass carried by the vehicle and the type of the vehicle.

Varying the price by the mass carried by the vehicle would represent a proxy for the increased wear done by vehicles that carry more weight. Varying the price by the vehicle type would represent an acknowledgement of the different service obtained by different vehicle types on the same category of road and enable price signals to be included to encourage certain outcomes, such as the use of safer vehicles.

Any vertical stratification of the road networks would have to include consideration of horizontal stratification of the networks, for example, on the basis of geographic and/or regional economic "boundaries".

Return on Value

In relation to freight, road and rail infrastructure are economic assets, the rate of return on which could be calculated on the investment in the asset. However, in the interests of encouraging strategic and targeted investment in freight transport infrastructure, one possible consideration is calculation of the rate of return on the value of the asset. The value of an asset would not be the construction or replacement costs of the asset but a measure of the value of the service provided by the asset to the community and the economy.

Focusing on the value of an asset would initially encourage investment that would maintain the current value of the asset. Further investment would be targeted at increasing the value of the total asset over time, encouraging strategic consideration of the provision of freight transport infrastructure in relation to its importance to the national economy.

Current and emerging guidelines on cost-benefit analysis of investment proposals in transport infrastructure being facilitated by the Australian Transport Council may provide a basis for determining the value of the freight transport infrastructure assets, as would the assessment of the capacity, level of access and externalities (such as congestion and pollution) created/provided by the infrastructure, as well as the risk management approach taken in the provision of safe and reliable access to the network.

In considering a return on value based pricing regime, it may be necessary to include a universal service obligation in the provision of freight transport infrastructure to ensure a minimum level of service is maintained, where and as appropriate. Furthermore, certain obligations exist in relation to existing roads as road networks cannot simply be withdrawn from service. For example, closing a road could affect access rights to land.

Asset Renewal Pricing

An alternative approach to determining the level of revenue required to be generated by a pricing regime could be based on the forward projections of the asset investment or renewal required to maintain or achieve a desired level of service. Such an approach could be taken in relation to routes for which a valuation is difficult to determine or in which a social obligation exists that overrides other valuations of the route.

Redistribution of Fixed Road Charges

As noted above, the revenue generated through the annual fixed charges applied to FIRS vehicles is redistributed among the jurisdictions on the basis of where the vehicles were estimated to be operating in recognition of the impact of those vehicles on the jurisdictions.

The Commission may wish to consider the merits of redistributing registration charges among the jurisdictions on a similar basis, regardless of the jurisdiction that the vehicles are notionally registered in. In particular, NSW recommends that the Productivity Commission give consideration to:

- The pooling nationally and redistribution among jurisdictions of annual registration charges for selected types of heavy vehicles (such as articulated vehicles, B-doubles, road-trains and the like) in accordance with the estimated impact of these vehicles on the relevant jurisdictions.

- The redistribution of such a national pool on the basis of the location of vehicle activity as indicated by in-vehicle telematics or as a result of previous or future ABS surveys.

- Recovering the cost of enforcement from the national pool of registration charges.

The Commission may wish to give consideration to the implementation of such a reform as an early and interim step towards further, more extensive, reforms in relation to mass, distance and location based pricing. Such a reform would assist in addressing the disproportionate burden the current arrangements places on NSW without restricting the potential for further reforms or increasing the financial or administrative burden on the industry.

Treatment of Externalities

In-principle, pricing based on the true economic cost of providing freight transport infrastructure should reflect the externalities associated with both modes of freight transport. However, there are presently acknowledged difficulties in costing certain externalities.

Externalities should be included in the cost base if they can be measured and valued accurately; pricing is technically feasible and cost effective (for example, the cost of identifying and collecting data should not outweigh the benefits); and pricing is the appropriate policy response to address that externality – that is, it is likely to generate a more efficient outcome, and can apply to all relevant infrastructure users.

The Commission should consider whether it is economically beneficial and practical to incorporate all externalities within a single infrastructure tariff or price. In addition to the technical challenge of fully pricing environmental externalities, the breadth of externalities, whether they are of a local or global nature, may mean that there may be no simple and generally sufficient condition to implement efficient pricing of road and rail freight infrastructure.

Where it is difficult or inappropriate to internalise certain costs through pricing regimes, an efficient approach to instigating behavioural change may be regulation, including through liability laws, external setting of environmental standards, vehicle standards and regulations, road rules and access compliance enforcement. In such situations, the cost of the enforcement of the regulations could be a reasonable proxy for the cost of the externality.

The recovery of enforcement costs was considered within the context of the 3rd Heavy Vehicle Road Pricing Determination. Whilst the failure to attempt to recover enforcement costs through the 3rd Determination further highlights the weaknesses of PAYGO, it should be relatively straight forward to recover these costs through a stand alone initiative or as part of a broader reform of road pricing. Furthermore, it should be noted that even in an industry that is fully compliant with the relevant regulations, the cost of ensuring compliance would still exist and should still be recovered.

The NSW Government operates the most substantial heavy vehicle compliance program in Australia. As a key part of this program, every year, the RTA conducts some 21 million electronic on-road surveillance and screening checks upon heavy vehicles, intercepts and examines some 435,000 heavy vehicles, conducts 1,000,000 heavy vehicle road worthiness inspections, and issues 45,000 heavy vehicle infringements. The NSW Police Service makes a further substantial contribution to the on-road heavy vehicle compliance program.

It could be argued that enforcement costs being funded from consolidated revenue is a form of implicit subsidisation. As for all forms of externalities, it would be desirable to recover the cost of the externality from the source of this externality where possible.

The specific questions raised by the Productivity Commission in its Issues Paper relate to the valuation of quality-adjusted life-years and valuation of the costs of externalities associated

with transport, in particular greenhouse gas emissions and pollutants. Information on these issues are provided at Appendix C

It is noted that the Council of Australian Governments, under its new National Reform Agenda, has agreed to separate pieces of work that have relevance to the Productivity Commission's Inquiry, including:

- The Australian Transport Council (ATC) and Environment Protection and Heritage Council's (EPHC) report on programs and incentives to encourage the uptake of more fuel efficient and low emission passenger and freight vehicles, travel demand management, and opportunities for reforms to improve vehicle fuel efficiency; and
- An inter-jurisdictional review of the main causes, trends, impacts and options for managing the impact of urban transport congestion on national freight corridors.

Valuation of Land

In relation to the valuation of land, NSW's Roads and Traffic Authority has invested considerable resources in determining the value of land used in relation to roads. The main consideration when valuing land is the opportunity value of the land. The opportunity value of land includes an assessment of the present discounted value of future rental income from alternative uses of the land and the present discounted value of the land at the end of the life of the "project" should it have a limited life.

Land used and bridges built for the provision of roads is often used for other purposes, such as grazing and the provision of utilities. These activities are often undertaken free of charge and further contribute to other costs incurred in the provision of the road, such as increasing the vulnerability and fragility of pavement structures due to underlying utilities and contributing to externalities such as accidents involving utility poles or unattended livestock. Consideration could be given to both the implications of these activities on the value of land and the viability and appropriateness of these activities being charged for the use of these assets.

Other Studies the Productivity Commission may find useful

- Ministerial Inquiry into Sustainable Transport in NSW, Options for the Future, August 2003 (www.transport.nsw.gov.au/ministerial_inquiry/).

- Rail Infrastructure Pricing: Principles and Best Practice, Report 109, BTRE, July 2003.

- Refocusing Road User Charging, John Cox, prepared for the Business Council of Australia, August 1994.

- The European Commission working group on Transport Infrastructure Charging (GTIC) Final Report "Estimating the Costs of Transport", May 1999.

- BTRE database of transport elasticities - http://dynamic.dotars.gov.au/btre/tedb/index.cfm

- The Hume Highway Strategy Study – Road and Rail Upgrading Analysis, Booz Allen and Connell Wagner, October 2003.

- Aspects of the NSW Rail Access Regime, Final Report, (IPART, 1999)) www.railcorp.info/_data/assets/file/673/IPART_Final_Report_1999.pdf)

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Bureau of Transport and Regional Economics (2), *Demand Projects for AusLink Non-Urban Corridors*, Working Paper 66. 2006

Bureau of Transport and Regional Economics (3), *Freight Measurement and Modelling in Australia*, Report 112, 2006

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National Transport Commission "*Twice the Task" A Review of Australia's Freight Transport Tasks*, February 2006

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Senate Rural and Regional Affairs and Transport Legislation Committee, *Provisions of the AusLink (National Land Transport Bill) 2004 and the AusLink (National Land Transport – Consequential and Transitional Provisions) Bill 2004*, May 2005

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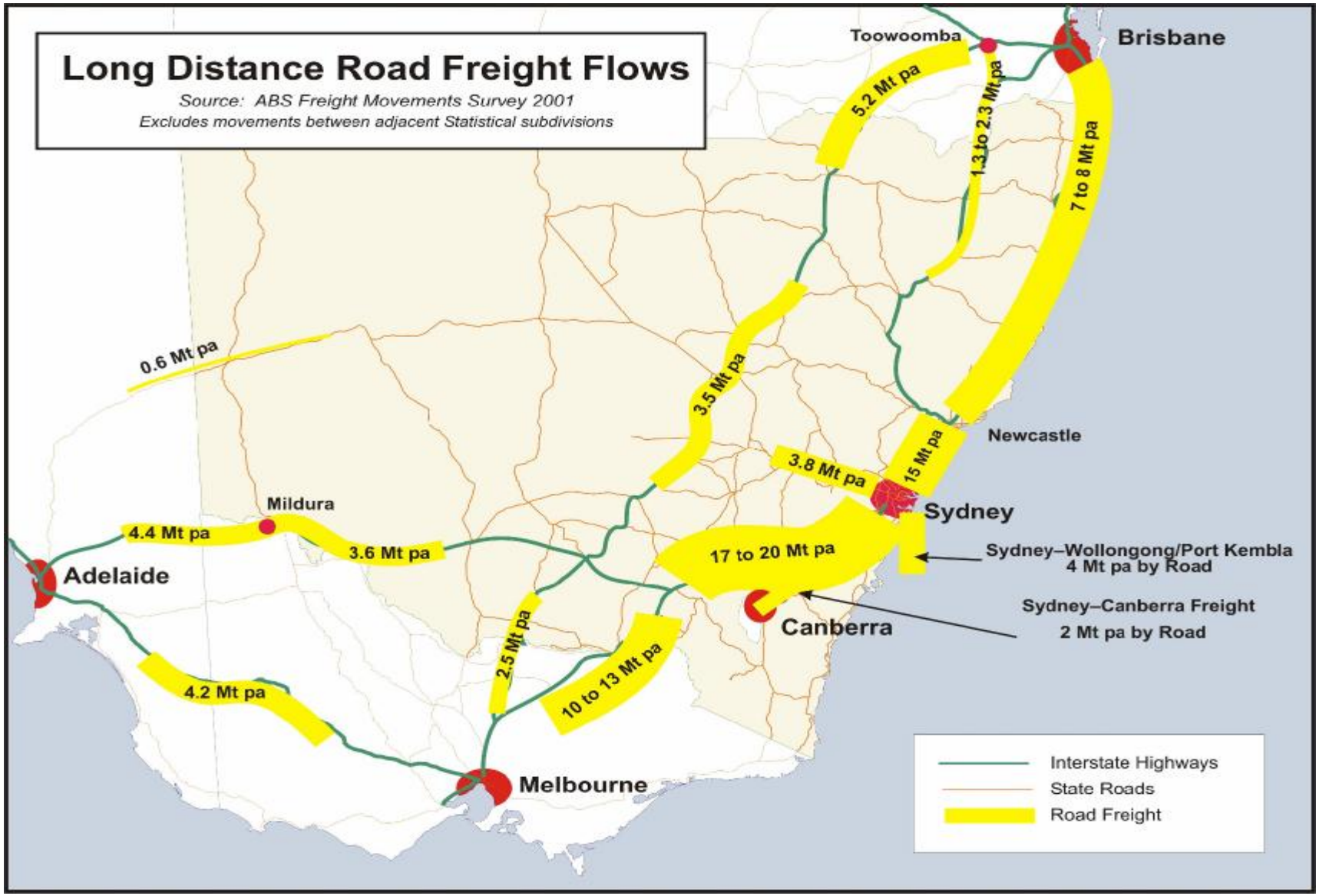
NSW Government agency data

APPENDIX A


Long Distance Road Freight Flows
Source: ABS Freight Movements Survey 2001
Excludes movements between adjacent Statistical subdivisions
Toowoomba
Brisbane
5.2 Mt pa
1.3 to 2.3 Mt pa
7 to 8 Mt pa
0.6 Mt pa
3.5 Mt pa
Newcastle
3.8 Mt pa
15 Mt pa
Mildura
Sydney
4.4 Mt pa
3.6 Mt pa
17 to 20 Mt pa
Sydney–Wollongong/Port Kembla
4 Mt pa by Road
Adelaide
Sydney–Canberra Freight
2 Mt pa by Road
Canberra
2.5 Mt pa
10 to 13 Mt pa
4.2 Mt pa
Melbourne
Interstate Highways
State Roads
Road Freight

APPENDIX B

FREIGHT TASK

Sydney/Port Botany

Table 1 - Current Container Trade

Port Botany Container Trade 2004-05	Imports (Full)	Exports (Full)	Exports (Empty)	Total
per cent Road	88 per cent	53 per cent	89 per cent	80 per cent
per centRail	12 per cent	47 per cent	11 per cent	20 per cent
Total TEUs	661,000	289,000	347,000	1,297,000
per cent Metro Sydney	99 per cent	60 per cent	100 per cent	91 per cent
per cent Rural NSW	1 per cent	40 per cent	0 per cent	9 per cent

Source: NSW Maritime

Table 2 - Current Bulk Liquids, Gases & Oil Trade

Port Botany Bulk Trade (Mass Tonnes) 2004/05	Import	Export	Total
Bulk Liquid and Gas	413,241	73,084	486,325
Oil	7,278,565	562,939	7,841,504
Total	7,691,806	636,023	8,327,829

Source: NSW Maritime

Table 3 - Forecast Bulk Liquids, Gases & Oil Trade

Port Botany Bulk Trade (Mass Tonnes) Forecast	Oil	Bulk Liquid & Gas	Total
2004/05	7,841,504	486,325	8,327,829
2011	8,830,807	547,681	9,378,488
2016	9,749,925	604,684	10,354,609
2021	10,764,705	667,620	11,432,325
2025	11,652,062	722,653	12,347,716

Source: NSW Maritime

From the Bulk Liquids Berth in Port Botany, bulk liquids and gas products travel to adjacent terminal storage tanks in the Port Botany precinct by pipeline. Approximately 95 per cent of the product is distributed by road and the remainder distributed by pipeline to a manufacturing facility in an adjacent industrial estate.

Kurnell oil products travel from wharf/berth to adjacent terminal storage tanks by pipeline. The majority of the product is then transferred by pipeline to distribution facilities at Clyde/Silverwater, Banksmeadow and Newcastle. The product is then distributed mainly by road, although some regional areas such as Dubbo are serviced by train.

Port Botany bulk liquids and gases, including oil, are expected to grow at around 2 per cent pa to a total of approximately 12.4million tonnes by 2025. The method of transport is expected to remain the same.

Port of Newcastle

Table 4 - Trade handled entirely or predominately (>95 per cent) by rail

Commodity	2005-06 Forecast (Million tonnes)	2006-07 Forecast (Million tonnes)	2007-08 Forecast (Million tonnes)	2008-09 Forecast (Million tonnes)
Coal	82.50	86.00	89.00	91.50
Wheat	1.71	1.37	1.14	1.14
Concentrates	0.34	0.41	0.45	0.46

Source: NSW Maritime

Table 5- Trade handled entirely or predominately (>95 per cent) by road

Commodity	2005-06 Forecast (Million tonnes)	2006-07 Forecast (Million tonnes)	2007-08 Forecast (Million tonnes)	2008-09 Forecast (Million tonnes)
Alumina	1.30	1.30	1.30	1.30
Aluminium	0.15	0.18	0.18	0.18
Fertilisers	0.34	0.46	0.48	0.48
Steel	0.32	0.29	0.31	0.31
Woodchips	0.25	0.25	0.25	0.25
Others	1.47	1.76	2.26	2.20

Source: NSW Maritime

Port Kembla

Table 6 – Commodities handled at Port Kembla

Commodity	Road (Million tonnes)	Rail (Million Tonnes)
Coal	4.0	6.6
Grain	0	1.0
Other	0.5	0.6

Source: NSW Maritime

Port Kembla's freight task is anticipated to increase by approximately 270,000 motor vehicles and approximately 30,000 containers after trade is relocated from Port Jackson by 2008. By that stage, the freight task at Port Kembla is estimated to be 20 per cent rail and 80 per cent road.

PRIMARY COMMODITIES

1. *Agricultural crop and harvest "load"*

The regions which produce the greatest mass of agricultural (non-livestock) product are the regions in the centre of the state, where grain output dominates the bulk of produce by weight. The total volume of agricultural product (derived from census data) for each region is shown in Table 1, with the regions ranked in volume of output.

Table 1: Total volume agricultural output of NSW regions

Region	Tonnes output
Murrumbidgee SD	4,413,581
Murray SD	3,469,990
Northern SD	2,840,867
Central West SD	2,667,178
North Western SD	2,230,811
Richmond-Tweed SD	1,413,820
Mid-North Coast SD	970,413
South Eastern SD	639,697
Hunter SD	425,580
Illawarra SD	204,264
Sydney SD	165,798
Far West SD	79,345
Total NSW	**19,521,344**

Source: ABS, NSW Department of Primary Industries

Trends

There is a modest upward trend in the production of grains and oilseeds, although this is not discernible in the short-term under the dominant influence of seasonal variation. The data used in this assessment is from the 2001 census (latest available statistics). After 2001, production decreased substantially as a result of the drought. Grain production is now recovering, although rice and cotton production levels are still down from decreases in the supply of irrigation water.

For the purposes of this assessment it is assumed that production levels of agricultural crops and animal products will be at similar levels in 2010 to those of the 2001 census.

2. *Livestock "load"*

The potential regional livestock "load" is assessed by referring to the annual mass of animals of different sorts, calculated from the regional population counted in the census, and attributing crude average weights to each type of animal.

The significance of the livestock population in creating a freight load is more complex than that of the crops load, which is a "one-off" requirement for movement. Cattle and sheep, but especially cattle, are moved around during their life cycle, as well as at the end when they are heading for slaughter and processing. In drier years, there is some agistment of cattle, initially moving stock to better feed, and then returning them when conditions change. These movements are both local and long-distance. There is also a considerable movement of interstate cattle, generally from the northern part of Australia, into NSW and across NSW into Victoria. None of this movement can be estimated on a volumetric or regional basis, as there is no supporting data.

The livestock product "load" generated regionally in NSW is estimated to have been in the order of the amounts shown in Table 2.

Table 2: Estimated Regional Livestock “load” (tonnes)

tonnes	Estimated cattle "load"	Estimated sheep "load"	Estimated pig "load"	Estimated poultry "load"	Total regional livestock "load" (tonnes)
Central West SD	131,000	115,000	18,000		**264,000**
Far West SD	17,000	32,000			**49,000**
Hunter SD	125,000	7,000	15,800	159,300	**307,100**
Illawarra SD	21,000		2,400	800	**24,200**
Mid-North Coast SD	76,000		1,100		**77,100**
Murray SD	121,000	71,000	84,000		**276,000**
Murrumbidgee SD	125,000	89,000	17,000		**231,000**
North Western SD	179,000	117,000	10,000	200	**306,200**
Northern SD	347,000	94,000	21,400	43,800	**506,200**
Richmond-Tweed SD	57,000		20,400	12,100	**89,500**
South Eastern SD	102,000	109,000	22,700		**233,700**
Sydney SD	8,000		6,400	151,200	**165,600**
total	1,309,000	634,000	219,200	367,400	**2,529,600**

Source: ABS Agricultural Census 2001

Trends in Livestock production

There are no significant long-term trends forecast in livestock production that will impact on the “load” it constitutes for the transport system. In the early years of the drought, 2002 and 2003, there was an increase in movements by agistment and some increased sale, with corresponding short term declines in following years.

3. *Mineral Product “load”*

Coal is by far the “bulkiest” of mineral products mined in NSW, and the Hunter region dominates its production. Coal is also produced in the Central West (Lithgow), Illawarra, North Western (Mudgee) and Northern (Gunnedah) regions. Copper is produced in the Orange, Parkes and Cobar districts, and zinc and lead at Cobar and Broken Hill. Copper, zinc and lead freight loads are the volume of concentrate transported for refining. Although important in value, gold is not produced in quantities significant to transport. Significant quantities of limestone are produced near Goulburn at Marulan, and in Mudgee and near Tamworth. Sands and gravels are mostly produced near Sydney, in locations all within the Sydney SD. Regional mineral production for 2004-05 is shown in Table 3.

All coal, copper, zinc and lead is transported by rail. Coal is exported through Newcastle and Port Kembla. Most limestone and sands and gravel are transported by road.

Trends

ABARE forecasts (Australian Commodities, March quarter, 2006) are that Australian coal production will increase by 30 million tonnes between 2004-05 and 2010-11. As NSW produces one third of Australia’s production, this would be an increased “load” of up to 10 million tonnes, most of which would come from the Hunter region. The Minister has recently announced exploration of resources at Caroona, near Werris Creek, but it is unlikely that its estimated reserves of 1.5 million will be developed by 2010.

ABARE also forecasts (ABARE, ibid.) a 200,000 tonne increase in Australian copper production between 2004-05, some of which is expected to come from Tritton Resources mine at Girilambone, south of Cobar in the North Western region.

Table 3: Regional Mineral Production (tonnes), 2004-05

Region	Coal	Copper concentrate	Zinc concentrate	Lead concentrate	Limestone	Sand and Gravel	Total regional mineral "load" (tonnes)
Central West SD	8,000,000	442,500					**8,442,500**
Far West SD			375,000	187,500			**562,500**
Hunter SD	94,200,000						**94,200,000**
Illawarra SD	10,100,000						**10,100,000**
Mid-North Coast SD							
Murray SD							
Murrumbidgee SD							
North Western SD	8,000,000	147,500	137,500	70,000	800,000		**9,155,000**
Northern SD	973,000				800,000		**1,773,000**
Richmond-Tweed SD							
South Eastern SD					3,000,000	3,600,000	**6,600,000**
Sydney SD						10,200,000	**10,200,000**
Total NSW	**121,273,000**	**590,000**	**512,500**	**257,500**	**4,600,000**	**13,800,000**	**141,033,000**

Source: NSW Department of Primary Industries

4. *Forestry Product "load"*

Hardwood forest products come from the native forests centred around the eastern ranges of NSW, with the largest volumes coming from the eastern slopes in the Mid North Coast and South Eastern regions. Hardwood production in the North Western region is from the Pilliga and Goonoo forests.

The main areas of softwood production are the softwood plantations around Tumut and Tumbarumba in the Murrumbidgee region, and around Oberon and Bathurst in the Central West. Table 4 below shows the 2004-05 production in the regions from data supplied by DPI.

Table 4: Regional Forest production (tonnes) 2004-05

Region	hardwood products	softwood products	**total forest products (tonnes) 2004-05**
Central West SD		929,734	**929,734**
Far West SD			
Hunter SD	106,066		**106,066**
Illawarra SD			
Mid-North Coast SD	587,773		**587,773**
Murray SD	28,287		**28,287**
Murrumbidgee SD	113,149	1,518,456	**1,631,605**
North Western SD	279,954		**279,954**
Northern SD		120,000	**120,000**
Richmond-Tweed SD		125,000	**125,000**
South Eastern SD	480,595	400,478	**881,073**
Sydney SD			
Total NSW	**1,595,825**	**3,093,668**	**4,689,493**

Source: NSW Department of Primary Industries

Trends
Production is expected to remain at similar levels during the coming decade.

5. *Other "loads" associated with primary production*

a) Inputs
Crops and livestock production use significant quantities of fertiliser, lime/gypsum, planting material, hay and other feeds (Table 5):

Table 5: Regional Use of Fertiliser, Lime/Gypsum and Hay, 2001

Region	Fertiliser usage - Total quantity used (t)	Lime Dolomite and Gypsum - total quantity used(t)	Hay sold year ended 30 June (t)	**Total, these inputs (tonnes)**
Central West SD	185,340	155,759	60,535	**401,633**
Far West SD	3,883	147	4,879	**8,910**
Hunter SD	39,461	9,931	13,135	**62,526**
Illawarra SD	10,895	7,099	1,410	**19,405**
Mid-North Coast SD	29,192	14,110	651	**43,953**
Murray SD	195,584	233,207	87,411	**516,201**
Murrumbidgee SD	265,482	255,029	46,758	**567,269**
North Western SD	148,244	61,009	25,915	**235,168**
Northern SD	296,800	46,389	40,342	**383,532**
Richmond-Tweed SD	22,030	10,163	1,621	**33,814**
South Eastern SD	104,388	87,573	9,161	**201,121**
Sydney SD	6,464	3,331	847	**10,642**
Total NSW	**1,307,763**	**883,747**	**292,664**	**2,484,174**

Source: ABS Agricultural Census, 2001

The NSW Government has no volumetric or regional data for fuel or machinery movements for agriculture, forestry and mining, however, heavy machinery is commonly used and it is dominantly moved around the state by road. At harvest time, a large number of wide-load headers (combine harvesters) are moved around and between the regions where wheat and barley are dominantly produced, and grape harvesting machinery is also driven around and between the wine grape production areas.

There is also a significant movement of mining machinery between the mining centres of NSW, and across NSW to neighbouring states.

b) Processed outputs
In addition to the raw material product of primary industries, there is a significant quantity of processed products, processed to a pre-packaged or pre-manufactured level, such as bulk unpackaged wine, meat carcasses and sawn timber. The transport load which they create is equivalent to a proportion of the raw material "load", and is additional to it, but there is no regional data to quantify it.

APPENDIX C

GREENHOUSE GAS EMISSIONS

The energy intensity of road versus rail

The Bureau of Transport and Regional Economics (BTRE, 2002, *Greenhouse Gas Emissions from Transport – Australian Trends to 2020*, Report 107) calculated that the current greenhouse emission intensity levels (in grams of full fuel cycle CO_2 equivalent per tonne-kilometre) are as follows:

- Commercial road freight has a combined intensity of approximately 184g/tkm, consisting of values of the order of 2000g/tkm for light commercial vehicles, 233g/tkm for rigid trucks and 82g/tkm for articulated trucks;

- Public (or Government) rail systems have a bulk freight emissions intensity of around 24g/tkm (including emissions of supply of electric power) and non-bulk freight intensity of around 33g/tkm. Private (bulk) rail freight has an intensity of close to 8g/tkm.

The BTRE also investigated several hypothetical policy scenarios for reducing emissions from the transport sector. Of the policies examined, optimal road pricing was judged to offer the largest potential for reducing greenhouse emissions from transport by 2010.

Valuation of greenhouse emissions

Emissions trading is a market based mechanism that factors the costs of the impacts of climate change into the decision making of those who emit greenhouse gases. An emissions trading scheme helps to provide price signals that take into account the full environmental costs and benefits of individual actions. It can provide a flexible means by which emission reduction targets can be met at least cost to the economy. A well designed scheme can encourage changes in behaviour, increase the uptake of low emission technologies and drive innovation in long term greenhouse gas emission reductions.

The NSW Greenhouse Gas Abatement Scheme is one of the first mandatory greenhouse gas emissions trading schemes in the world. The Scheme aims to reduce greenhouse gas emissions associated with the production and use of electricity and to encourage participation in activities to offset the production of greenhouse gas emissions. The trading price in April 2006 was approximately $15 per tonne of CO_2-e emissions.

Given that road transport dominates transport sector emissions (currently accounting for 88 per cent of emissions), by encouraging a shift into less energy-intensive transport modes, appropriate price signals have the potential to be a significant abatement measure.

AIR POLLUTION

Freight traffic and its growth is an important issue for air emissions. While passenger car travel accounts for the majority of emissions and fuel consumption, road freight has a disproportionate impact relative to its presence, in terms of noxious and greenhouse emissions.

Light commercial vehicles, rigid trucks and articulated trucks together made up 17 percent of NSW registered vehicles in 2003, but accounted for 31 per cent of the 8.5 GL of fuel consumed by road transport in NSW in 2003 and 34 per cent of the 21.3 Gg of CO2 equivalent emissions - expected to grow to 38 per cent by 2020. (NSW Department of Planning 2005).

Health impacts from air pollution

There remain limitations on the methods used to quantify the health impacts from pollution and greenhouse gas emissions.

The costing of health impacts attributable to air pollution have been undertaken in two reports:

- *Air Pollution Economics: Health Costs of Air Pollution in the Greater Sydney Metropolitan Region*, NSW Department of Environment and Conservation, 2006; and
- *Health Impacts of Transport Emissions In Australia: Economic Costs*, Bureau of Transport and Regional Economics, Working Paper 63, 2005.

The impacts of air pollution have been estimated in these reports based on observed associations between average air pollution levels at regional level and various health impacts. They use particular matter of size less than 10 micron as an indicator of pollution, and cannot account for any potential difference in pollution composition between road and rail transportation. The reports have not attempted to separate pollution due to freight transport from those due to cars. There are consequently limitations in applying the methods used to an assessment of potential health impacts associated with freight infrastructure.

It would be expected that freight transport could have localised air pollution impacts, depending on the nature of transport corridor. The effective internalisation of health costs of transport-related air pollution should take into consideration the comparative health costs of rail versus road. It would also be appropriate to consider the air and noise pollution impacts of intermodal facilities.

VALUATION OF QUALITY-ADJUSTED LIFE-YEAR

There are a range of methods for valuing life and health. Because policies usually reduce the risk of death for many individuals, the value of life is generally described as the value of a statistical life (VSOL). Based on a review of international studies and EnHealth Council's (2003) recommendation, the NSW Department of Environment and Conservation adopts a low and high VSOL of between A$1 million and A$2.5 million.

Loss of health is measured in equivalent quality adjusted years (QALYs) that take into account the various features of morbidities. The QALY approach allows information relating to the health state of the individual at risk to be included by weighting the life expectancy of an individual with a perceived health status. To calculate QALYs, health status of quality of life (QoL) indices have been developed to capture the multiple dimensions of health. Mathers et al. (1999) estimate QoLs for a wide range of morbidities in Australian conditions.

The EnHealth Council (2003) recommends a discount rate of 5 per cent for environmental health programs with sensitivity rates ranging from 3 to 7 per cent. The argument put forward by EnHealth is that lower discount rates more accurately reflect consumer rates of discount and recent trends in the returns to capital. EnHealth recommends that when a project competes for investment funds with other economic sectors, official discount rates should be taken into consideration.

<u>Studies the Productivity Commission may find useful</u>

- Department of Environment and Conservation, 2006, *Air Pollution Economics, Health Costs of Air Pollution in the Greater Sydney Metropolitan Region* (www.environment.nsw.gov.au/resources/airpollution05623.pdf)

- Coffey Geosciences Pty Ltd for the Motor Vehicle Environment Committee, 2003, *Fuel Quality and Vehicle Emission Standards Post 2006 – Cost Benefit Analysis*, (www.deh.gov.au/atmosphere/fuelquality/publications/december-2003.html)

- Department of Environment and Heritage, 2001, *Australian State of the Environment Report, Atmosphere Theme Report , Mortality and morbidity from respiratory disease* (www.deh.gov.au/soe/2001/atmosphere/atmosphere04-6d.html)

- Bureau of Transport and Regional Economics, 2002, *Greenhouse Gas Emissions from Transport – Australian Trends to 2020*, Report 107

- Bureau of Transport and Regional Economics, 2005, Health Impacts of Transport Emissions in Australia – Economic Costs, Working Paper 63 (www.btre.gov.au/docs/workingpapers/wp63/wp63.pdf)

- Australian Academy of Technological Sciences and Engineering (1997), *Urban Air Pollution in Australia*, Carlton South, Victoria.

- EC (2002), "*Estimates of Marginal External Costs of Air Pollution in Europe*", European Commission, sourced from: (europa.eu.int/comm/environment/enveco/studies2.htm#air)

- Morrison & Bernauer (1995), *External Costs of Petrol Consumption*, NSW Environment Protection Authority, Chatswood.

- NEPC (1998), Revised Impact Statement and National Environment Protection Measure for Ambient Air Quality, National Environment Protection Council, Adelaide.