SUBMISSION TO

NATIONAL ROAD TRANSPORT COMMISSION

INTO

3RD HEAVY VEHICLE ROAD PRICING DETERMINATION

OCTOBER 2003

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Introduction

AAA represents the interests of over 6 million motorists through its State and Territory motoring Clubs and associations. As such, we have a keen interest in road pricing and the related issue of fuel taxation, and how motorists should be charged for the use of the road. It follows that since we share the road with trucks (and buses, cyclists and pedestrians) we also have an interest in heavy vehicle charging and how the costs of road construction and maintenance should be allocated among the various users.

Background

AAA has argued over a period of many years that the current fuel taxation arrangements have a number of shortcomings. In particular:

- they have revenue raising objectives, rather than objectives of efficient resource allocation;
- by taxing intermediate inputs, they encourage resource allocation inefficiencies in the use of fuel and reduce the international competitiveness of industries intensive in their direct and indirect use of fuel;
- they fail to achieve efficient use of roads;
- they are regressive and penalise regional relative to urban road users; and
- they are costly to administer.

In order to overcome these shortcomings, we have argued that an ideal fuel tax system would separate its revenue raising role from its role in infrastructure charging.

With the GST now well in place, it is our view that there is no longer any justification on revenue raising grounds to tax fuel any differently from the tax treatment of other goods and services.

The appropriate tax on fuel for revenue raising is therefore:

- 10 per cent GST on all fuels (no exceptions)
- no indexation (GST is an ad valorem tax)
- No on-road/off-road distinction

This should apply in the case of cars and heavy vehicles.

Efficient use of roads

Economic theory suggests that to achieve an efficient use of existing roads, road users should be charged according to the full marginal social cost they impose through using the road — the so-called short run marginal cost pricing rule. Marginal social cost measures the resource cost to society of the road

user's decision to make the journey. The cost of the original investment in the road is sunk and plays no role in the efficient pricing rule.

How to achieve cost recovery for investments in new roads is a separate issue from achieving an efficient use of roads. If economies of scale are important then there is no guarantee that revenues collected under efficient pricing will achieve full cost recovery — though if congestion is priced realistically on urban roads more than full cost recovery may eventuate.

If charges in excess of marginal social costs are levied on road users to, say, achieve full cost recovery, then this is no different — from a resource efficiency viewpoint — to a revenue raising tax. The key point is that road users should pay the cost of their use of roads to ensure that the value they derive from road use will at least cover the costs to society of their use. Unlike other forms of national infrastructure such as electricity, telecommunications, gas, water, railways and ports, roads stand out as for the most part not being subject to user pays pricing rules.

Paying for the social cost of using roads

Road users impose four components of social costs:

- road use and wear
- environmental harm
- congestion costs
- crashes and injury/death.

To achieve an efficient use of roads, road users should be charged for these costs according to the marginal cost their travel decision imposes. How best to charge for each category of cost is the key issue.

Charges on fuel may have a role in charging for these costs if, and only if, there is no other more direct, efficient and practical way of charging for each component of the social cost of using roads.

Charging for road use and wear

Road users 'use' infrastructure in that they wear and damage it. As reported in the Issues paper, pavement damage depends on the technical characteristics of the road, the axle configuration of vehicles and load per axle as well as distance travelled. In principle, charges can be set to match these costs — charges based on mass/axle weight and distance travelled.

Heavy vehicles cause considerable pavement wear. Ideally this should be charged for directly. We acknowledge the considerable analysis on appropriate road user charges for these vehicles which has been undertaken by the National Road Transport Commission (NRTC) and the various refinements introduced since 1995. However, the objective followed by the NRTC is a budgetary one — full cost recovery — rather than the desired economic efficiency objective of marginal cost pricing of road use. There is no direct link between revenue collected from the charges and spending on roads.

By contrast, cars and light commercial vehicles cause negligible wear to most roads. An infrastructure use charging system operating through a charge on fuel used in road transport should reflect this by having only a very small

charge for cars and light commercial vehicles and a much larger charge for heavy vehicles.

Charging infrastructure use through a uniform charge on all fuels will result in gross overcharging of light vehicles and undercharging of heavy vehicles. Fuels used off road should not incur the infrastructure use charge.

Charging for environmental damage

The use of vehicles can cause damage to the environment — through noise and emissions. Fuel combustion releases an array of pollutants including organic compounds, nitrogen oxides, carbon gases and particulates. These can be harmful to human health through exacerbating respiratory problems, although technical change in engines and fuels is bringing about dramatic changes in emissions levels and the air quality in Australian cities is improving. The environmental risks of greenhouse gases are well documented. Vehicle noise can also be regarded as a cost imposed by road users on others. Its cost is traditionally measured in terms of the reduction in house prices in affected areas.

It is appropriate that vehicle users be charged for the damage they do to the environment to internalise these costs. This will provide incentives for environmental damage to be reduced. It could also provide funds to compensate the losers if deemed necessary.

The amount of environmental damage from emissions will vary according to the type of vehicle (particularly engine size and efficiency), the type and cleanliness of the fuel and where the vehicle is used. Charging directly and accurately for environmental damage is therefore difficult. A compromise is needed between the efficiency gains from a highly differentiated set of charges to reflect actual environmental damage in a particular situation and the administrative cost of greater complexity in the charging system.

It would make sense to impose some of the environmental charge through registration fees — which could reflect, for example, engine size and efficiency. There is also an important role for different registration charges based on the fuel used in road vehicles. These charges should vary according to the cleanliness of the fuel.

Determining the appropriate fuel charge component to account for vehicle emissions is difficult. However, motor vehicle emissions and hence health costs have fallen sharply since the introduction of catalytic converters and other devices and improved fuel quality. This emphasises that a charge for environmental damage would need to be regularly reviewed and adjusted as new engine technologies and emissions standards are introduced. The regime should not be an impediment to the introduction of new technologies and should be considered as a tool for encouragement.

Emissions of carbon dioxide from motor vehicles could also have an impact on the future global climate in the ‘greenhouse effect’. Road transport accounts for around 20 per cent of Australia’s net carbon dioxide emissions and only 15 per cent of Australia’s total greenhouse gas emissions. This equates to 67 million tonnes of emissions each year (AGO 2001).

Cars and wagons account for 63 per cent of road transport emissions and light commercial vehicles and trucks account for 35 per cent — the remainder comes from buses and motorbikes.

Road transport emissions grew by 2.2 per cent a year between 1990 and 1999. It is estimated that without reduction measures, emissions from the transport sector will rise by 38 per cent between 1990 and 2010 (AGO 2001).

The growth in emissions from trucks will greatly exceed those from cars (at least double the rate based on historical trends).

Greenhouse gas emissions are related to the fuel used i.e. the amount of travel and the technical efficiency of the vehicle using the fuel. For carbon dioxide, emissions solely depend on the amount of fuel used which depends on the fuel efficiency of the vehicle and distance travelled. For other greenhouse gases, emissions depend on the technology installed in the car. For example, emissions of methane are 45 per cent lower in cars made after 1985 than in cars made before 1985. Carbon monoxide emissions are 60 per cent lower in cars made after 1985 (AGO 2001).

Given that greenhouse emissions depend on fuel use and type/quality, a fuel charge may be an appropriate means of reducing emissions. The appropriate rate of the charge, however, depends on the overall policy framework Australia adopts in order to reduce greenhouse gas emissions.

It is a well established principle that the optimal approach to greenhouse gas abatement is to find a policy framework that equates the marginal cost of abatement for *all* emitting sectors. The key features of this principle are that:

- it is not appropriate for any single sector to bear the full burden of abatement; and
- abatement should take place where it is least costly to do so.

It is inappropriate for the transport (or any other sector) to go it alone in emissions reductions. Rather, any policy should have the broadest possible coverage. There are two broad categories of policy that satisfy this principle: a uniform carbon (or carbon equivalent) tax, or some form of emissions trading scheme.

A uniform carbon tax automatically equates the marginal cost of abatement for all sectors. This approach has the advantage that the rate of tax is known in advance. Its disadvantage is that the amount of abatement is not known in advance. Under emissions trading, the permit price that emerges in the emissions market is the means by which marginal abatement costs are equated. With trading, the total amount of abatement is specified (and known) in advance, but the permit price is not.

What carbon tax, or permit price, would lead to Australia satisfying its international obligations? A large number of studies have attempted to estimate this. Three broad sets of results have emerged.

- If Australia were to undertake abatement independently (without any sort of international trading scheme) the resulting permit price, or carbon tax, would be between $40 and $190 per tonne of carbon dioxide (AGO 1999).
- If Australia were to engage in a developed country trading scheme, the resulting permit price would be between $8 and $50 per tonne of carbon dioxide.
- If Australia were to engage in a global trading scheme, the resulting permit price would be between $5 and $34 per tonne of carbon dioxide.

What does this mean for fuel prices? Using average fuel emission coefficients this full range ($5 to $190 per tonne of carbon dioxide) amounts to a fuel charge of between 1 cent and 37 cpl. This range is far too large to provide any useful guide to fuel charging policy.

In summary, a charge on fuel to reflect environmental damage from road users is justifiable on resource allocation grounds. But there is no one ‘correct’ charge. In the case of greenhouse gas emissions there is no justification for Australia implementing a charge unless the Kyoto protocol is implemented. And in the case of charging for other emissions it is important that whatever

charge is adopted be subject to consistent review. Technical developments in engine design and efficiency and in the production of cleaner fuels are progressively being introduced. The appropriate environmental charges will need to be adjusted periodically to reflect this progress.

There is a number of other environmental impacts associated with motor vehicle transport, including:

- conversion of 'green' open space to roads and car parks;
- disposal of used tyres; and
- reduced visibility due to smog in densely populated urban areas (smog reduces the amenity value of the outdoor environment).

The size of these externalities is difficult to quantify in dollar terms and there are no recent estimates for Australia.

Charging for congestion

Roads with low volumes are viewed in economic jargon terms as pure public goods — their use by one motorist does not detract from their use by others. But many roads are becoming increasingly congested beyond design capacity, particularly in urban areas. The number of vehicles using the road at a given point in time exceeds the ability of the road to carry them at generally acceptable service levels.

Congestion imposes costs on other road users, in the form of increased travel time and running costs, and on society through increased localised pollution. Typically, road users are not charged for these costs, and in the absence of a price mechanism to allocate a road to those motorists who most value it, many roads are overused (congested) at particular times. The result is inefficiencies in road use, in vehicle use and in the use of motorists' time. The existence of congestion may imply underinvestment in the road network.

Because of the complexity of urban travel behaviour, estimating congestion costs is not straightforward. Nor is it easy to apportion the costs between light and heavy vehicles. Congestion costs are however, believed to be large. Congestion costs on roads in Australia's six major cities were estimated at $13 billion per year in 1995 (BTE 1999). Nearly half these costs were in Sydney.

Congestion pricing aims to charge road users for the costs they impose on other commuters. Prices should be set in accordance with the marginal congestion cost imposed by each additional vehicle on the road. Congestion charging is needed to send appropriate price signals to road users about the true cost of their trip, and as a result generate more 'efficient' traffic flows. Congestion charging provides an important marketed-based signal of the need for additional road investment as well as the timing of that investment. It has the potential to contribute much to fixing the road supply problem.

A first best congestion charging system involves charging according to location or trip route, time of day, number of vehicles on the road at the time and vehicle type. Since trucks take up much more space on roads than cars, charges would need to reflect the various PCUs (passenger car units) of trucks (eg six axle articulated vehicle is equivalent to 3 PCUs).

Ideally congestion charging should be introduced over as wide a network of roads as is practicable. If this does not occur spillover effects may be generated, as vehicles divert to other roads to avoid charges, causing congestion in areas or at times that were previously uncongested. Equity considerations would require that all vehicles be levied with congestion charges if they impose such costs on other road users. A congestion pricing

system must be cost effective to implement, be simple to administer and maintain, and be convenient for users.

Until the introduction of Global Positioning System (GPS) satellite technology, direct road pricing options had a number of drawbacks. In principle, GPS technology will allow for most of the criteria of a first best congestion pricing system to be achieved — time specific, location specific, vehicle type specific, convenient for users. GPS systems will be able to track each vehicle's location, and charge accordingly. However, audit systems will be necessary to ensure accuracy as the GPS devices alone will not provide sufficient legal status for the necessary transactions. While GPS systems already exist and are marketed to heavy vehicles, systems will also need to be introduced to actually collect the charge and legislation to require an on-board unit.

Trials of electronic pricing systems based on an in-vehicle positioning capability, GPS or VPS (vehicle positioning systems), are flourishing in a number of European cities in Germany, Switzerland, the United Kingdom, Italy and Scandinavia and several Asian countries. In Germany, trucks are being charged for distance travelled and gross vehicle mass. United Kingdom government has long ago (1993) signalled its intention to introduce electronic charging of its motorways when the technology is suitable. In Denmark a zone based pricing system based on GPS and digital maps is being tested. And the 1997 to 1999 Hong Kong electronic road pricing feasibility study (based on dedicated short-range communications rather than GPS) demonstrated its technical feasibility.

In Australia, the Tasmanian Department of Infrastructure, Energy and Resources is managing the national Intelligent Access Project. The focus of the Project is on demonstrating how certified service providers can deliver information services to industry and key road use data to road authorities. This would provide smart compliance opportunities for heavy vehicles that are subject to special access and operational arrangements. The project is based on vehicle positioning, data transmission and other in-vehicle and roadside technologies.

It appears reasonable to assume that these issues will be overcome in the near future, allowing the gradual adoption of such congestion charging mechanisms. However, until these issues have been resolved, especially concerns surrounding privacy and civil liberties, a second best charging scheme will need to be considered.

In the meantime, there is only a very weak justification for levying a charge on fuel to price congestion. Fuel purchases are largely unrelated to congestion. Fuel charges cannot distinguish between time of day, location of road and traffic density and vehicle type — they are paid by road users on empty roads as well as those in traffic jams.

Charging for vehicle crashes

Much of the potential costs of vehicle crashes are already internalised to the road user — through the purchase of 'safe' vehicles and various insurances. But there are also external costs that need to be charged back to road users to ensure that they face the full social costs of their road use. Intelligent use of third party insurance pricing should assist in costing crashes.

There were 1 725 fatalities on Australian roads in 2002. According to BTE (2000) the cost of road crashes in Australia in 1996 was $15 billion. At issue is how much of these costs are not internalised through third party and private property damage insurances and need to be charged for through some other mechanism. There is no consensus in the literature on this. One position is

that all crash costs should be regarded as externalities, while others argue that all relevant costs are already internalised. The majority of analysts take a mid-point position.

Most of these crash and injury causes are unlikely to be influenced by the level of charges on fuel. Drink driving and speeding, for example, are behavioural choices that are unrelated to the price of fuel. Direct regulation and enforcement is likely to be a more appropriate policy measure than a fuel charge. Nevertheless, an argument can be made for a charge on road users to reflect some external crash costs. The issue is one of how best to levy the charge — through fuel, per vehicle, etc. There is no ideal base for the charge, but if charges were to be based on vehicle type, they could relate to vehicle occupant protection and aggressivity.

Bringing it all together

An ideal charging system would be an integral part of a framework designed to achieve efficient use and provision of roads. It would contain an access charge which would give users the right to access the road system and a set of user charges based on actual road use. The access charge would, in principle, be small. It would be designed to cover the costs of registering and keeping track of vehicles.

The user charges would be set to recover from individual users the full marginal social costs of their use of roads. They would contain a component to reflect the use of road infrastructure. Ideally this would be a mass/axle weight distance based charge rather than a fuel charge. This would be negligible for light vehicles, but much higher for heavy vehicles.

There would also be a fuel based charge to reflect environmental costs of burning fossil fuels in road vehicles. The appropriate charge set for this would be revised periodically to take into account improvements in engine efficiency and fuel quality. Some part of the environmental charge could be built into the access charge to reflect the type of engine being used on the road.

There would be no charge for greenhouse gas emissions in the absence of implementation of the Kyoto agreement.

Congestion costs would be charged directly according to time of day (as parking charges are currently), location of road used and type of vehicle. In the absence of an effective direct charging mechanism there would be no charge on fuel designed to charge for congestion.

Regulations and changes to insurance, rather than fuel charges, could be used to reflect the social costs of crashes. In the context of heavy vehicles, there are several initiatives which have been demonstrated to make heavy vehicles less aggressive/dangerous to car occupants, including suitable front, rear and side under-run barriers, disc/ABS brakes and electronic on-board monitors to reduce risky behaviour. These initiatives have been consistently resisted over many years by the heavy vehicle industry despite extensive evidence from both overseas and locally that they would significantly reduce the incidence and severity of injury to road users. Under-run barriers are required by regulation on all heavy vehicles in Europe and ABS is essentially standard equipment. ABS brakes are required by regulation in the US.

In order to gain an indication of the order of magnitude of various charges which might apply if fuel excise *were* used as a basis of marginal cost pricing, analysis was conducted for AAA by John Cox and the results are presented in Table 1.

The charges include components for road use (wear), air pollution and noise pollution. Charges for congestion are not levied at this stage as fuel charges cannot sensibly charge for congestion. However, the numbers show that at least for light vehicles, excise is too high, and if it were reduced it would 'make room' for the introduction of congestion charges at the State and local level.

Table 1: Suggested initial charges for a fuel based charging system

	Cost component cpl				
	Air pollution	Noise	Crash	Road wear	Total
Light vehicles (less than 4.5 tonnes GVM)					
Capital city/urban	5.7	1.3	12.5	1.7	21.2
Regional/rural	0.0	0.5	15.7	2.8	19.0
Total	3.4	0.9	13.8	2.1	20.2
Heavy vehicles (greater than 4.5 tonnes GVM)					
Capital city/urban	20.5	12.0	5.8	5.1	43.4
Regional/rural	0.0	2.7	9.5	7.7	19.9
Total	8.3	6.4	8.0	6.7	29.4
All vehicles					
Capital city/urban	7.9	2.9	11.5	2.2	24.5
Regional/rural	0.0	1.1	14.0	4.1	19.2
Total	4.4	2.1	12.6	3.1	22.2

Source: AAA Submission to Fuel Taxation Inquiry

Table 2 shows the change in fuel charge from current charges assuming that we interpret the current excises net of grants, rebates and subsidies as a road user charge. Key points to note are:

- for light vehicles in both rural and urban areas the fuel charge would drop significantly — light vehicles are paying far too much excise on a road user charge basis; and
- for heavy vehicles in urban areas the charges would rise substantially — air pollution and noise costs of heavy vehicles in urban areas are substantial.

Note that these numbers are an initial estimate only, and while they provide a useful indication of the relative costs of road use, more work needs to be done to refine them.

Table 2: Implied change in fuel charge if existing excise (net of rebates, subsidies) is viewed as a road user charge

Vehicle	Capital city/urban		Rural/regional	
	Current net excise	Proposed charge	Current net excise	Proposed charge
	cpl	cpl	cpl	cpl
Light	38.1	21.2	37.1	19.0
Heavy (4.5–20 tonnes)	38.1	43.4	18.6	19.9
Heavy (greater than 20 tonnes)	19.6			

Source: AAA Submission to Fuel Taxation Inquiry.

It is our view that the NRTC and it successor (NTC) should urgently review the practicality and options of introducing more direct charging mechanisms

using GPS tracking and weigh-in-motion technologies and an appropriate fuel charging system along the lines outlined here. In addition, charging for light vehicles should be brought into the NTC's charter. In the meantime, further refinements of the existing charging methodology should be pursued based on full cost recovery.

A road use fuel charge for full cost recovery

In our submission to the Fuel Taxation Inquiry, we reported a study undertaken for AAA by John Cox which used the NRTC methodology to determine a fuel charge for light vehicles that corresponds to the heavy vehicle fuel charge of 20 cents/litre. The 1999 Survey of Motor Vehicle Use travel data was used (ABS 2000) while an average of the National Road Transport Commission (NRTC) arterial road expenditures for the years 1997-98, 1998-99 and 1999-2000 were used to update the costs used in the second determination of road user charges (NRTC 1998). Local roads expenditure was also updated in accordance with new data in BTE (2001).

Unlike the NRTC methodology, the study also determines the external costs from road transport of air pollution, noise pollution and road crashes and adds these costs to both the heavy and light vehicle fuel charges.

A further division of road supply, road safety, air pollution and noise pollution costs into urban and rural areas was made because some of these costs were more attributable to urban areas, such as air pollution, while others such as road supply costs derived from road expenditures were more attributable to rural areas. These urban and rural costs were then divided by an estimate of light and heavy vehicle fuel consumption in these two areas to come up with a fuel charge for light and heavy vehicles in both of these areas.

The latest available data was used to calculate a fuel charge in cents per litre for each cost component and then all costs were updated to 2000-01 values by employing appropriate inflation allowances.

The final costs are presented in Table 3.

Table 3: Fuel charges by area and light and heavy vehicles 2000-01

	Light vehicles			Heavy vehicles			All vehicles		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Air pollution	6.0	0.0	3.6	21.4	0.0	8.7	8.3	0.0	4.6
Noise pollution	1.3	0.5	1.0	12.3	2.7	6.6	2.9	1.1	2.1
Road safety	13.8	17.4	15.2	6.4	10.6	8.9	12.7	15.5	13.9
Road support	5.2	8.4	6.5	15.5	23.8	20.4	6.7	12.7	9.4

The light vehicle fuel charge of about 26 cents/litre in both urban and rural areas can be compared with the present excise of 38.1 cents/litre

The heavy vehicle fuel charge of 56 cents per litre in city areas and 37 cents per litre in rural areas can be compared with the present excise charge of 38.1 cents per litre for rigid trucks in urban areas and 38.14 – 18.51 diesel rebate = 19.6 cents per litre for rigid trucks in rural areas and articulated trucks in both urban and rural areas. It is seen that there is an undercharging of heavy vehicles of 37.1 – 19.6 = 17.5 cents per litre in urban areas and an undercharging of 55.7 – 19.6 = 36.1 cents per litre of trucks greater than 20 tonnes in urban areas.

The fact that trucks are undercharged compared to cars is also highlighted by further analysis undertaken by John Cox and Margaret Starrs for AAA. In the second determination, the NRTC methodology determined that heavy vehicle costs of $1390 million (or 30 per cent of total costs) were recovered through registration charges of $420 million per year and a fuel charge of about 20 cents/litre that raised $970 million.

If the same methodology is used for light vehicles by taking the existing vehicle registration charges as given, then the fuel charge can be estimated as 7.4 cents/litre compared to the heavy vehicle charge of 20 cents/litre as shown in Table 4.

Table 4: Previous determination of heavy and light vehicle charges 1996-97

	Total expenditure	Unallocated	Costs to be recovered
	$m	$m	$m
Arterial roads	4 210	580	3 630
Local roads	2 210	1 270	940
Totals	6 420	1 850	4 570
Heavy vehicle allocation for vehicle use			1 690[a]
Light vehicle allocation for vehicle use			3 190

Determination of fuel charge after subtracting registration charges 1998

	Unit	Heavy vehicle	Light vehicle	Totals
NRTC allocated costs		1 390	3 190	4 580
Registration charges		420	1 865	2 285
Fuel charge	$m	970	1 325	2 295
Fuel consumed	ML	4 750	17 850	
Fuel charge	cpl	20.4	7.4	

Note Light vehicle fuel use from Cox and Meyrick (1997).

The way forward

In the absence of direct charging methods based on marginal cost pricing, the NRTC should continue to refine its current full cost recovery charging approach.

In general terms, we consider that this should include the following:

- ensure that there is greater equity in charges between heavy and light vehicles;
- introduce distance based charging using tachographs and/or more advanced technology – perhaps using applications from the IAP - so that charges more accurately reflect the road wear costs of *individual* vehicles;
- ensure that the charges for larger heavy vehicles travelling large distances – which *a priori* are those that compete with rail - more accurately reflect their costs so that there is greater price neutrality between road and rail;
- ensure that the charges for higher mass limit vehicles using bridges more accurately reflect their costs so that there is a greater degree of cost recovery for the necessary bridge upgrading – some form of

annualised cost could be used and specific vehicles should be identified based on audits;
- update the attribution parameters, particularly those related to expenditure on local road and bridge expenditure, based on the latest research by ARRB and other sources;
- include a greater amount of local and urban local road expenditure as allocable expenditure rather than non-allocable - a much smaller amount should be regarded as solely to provide access and hence considered as non-allocable expenditure;
- use the number of vehicles, rather than VKT, as the attribution parameter of non-separable expenditure – since this is expenditure which cannot be attributed directly to road use, the number of vehicles is considered to be more appropriate.

AAA has no particular expertise in identifying the specific attribution parameters which should be in all cases. However, it does seem that there is a number of developments which are occurring which justify closer analysis of the relationship of the various parameters to road expenditure categories.

First, road freight is expected to increase significantly over the next 10 years and there will be growing competition from rail. This implies that 'accurate' charging for road use should become a priority, notwithstanding the fact that road charges represent only a small proportion of total vehicle operating costs.

Secondly, much better information is now available to refine the parameters. Such information includes that from the BTRE on local and State road expenditure (see, for example, BTRE Working Paper 56 'State Spending on Roads'; Working Paper 44; Spending on Local Roads'). There is also now better information available from Apelbaum Consulting on fuel consumption and distance travelled for different heavy vehicle classes. It is superior to ABS SMVU data which suffers from small sample sizes. There is also additional information on local road spending contained in the Report of the Roads to Recovery Programme (February 2003).

Third, the introduction of higher mass limits has resulted in a need for increased expenditure on bridge maintenance and new bridge construction, and roads more generally. Thus there will be additional costs in excess of that required to build a minimum possible standard of road. A separate, additional charge should therefore be levied on vehicles operating at the higher limits.

Fourth, there has been an increase in expenditure on local roads through the Roads to Recovery (R2R) Program. Much of the expenditure has been directed at improving transport efficiency, particularly for trucks. The Report on the R2R Program identifies a number of case studies including spending used to replace a three tonne load limited bridge to accommodate higher mass vehicles including B-doubles to service rural industry (Light Council, SA); to seal a road to upgrade through route for heavy traffic serving local industry (Tara Council, Qld); to replace a high maintenance timber bridge which had a 5 tonne load limit (Copmanhurst Council, NSW); upgrade road to

be used for haulage of ore from reopened gold mine (greater Bendigo Council, Vic). All of this suggests that there should be detailed review of the expenditure on local roads, to ensure that more of it is included in allocable expenditure and allocated to heavy vehicles.

Ideally, charges should be calculated for use of local roads using separate cost allocation parameters, with revenue from recovering costs of construction and maintenance (and other costs as appropriate) being allocated direct to local government.