COST RECOVERY IN ROAD TRANSPORT - DOES IT EXIST?

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ABSTRACT: Australia's road network is a significant asset requiring a substantial amount of money to be spent on it, each year, by all levels of Government. The method of funding this asset is, as one would expect, in the hands of Government.

> One method being touted for funding this road asset is for recovery of expenditure on the road network via cost recovery in the form of a "user pays" system.

> This paper reviews cost recovery and its history, discussing questions relating to cross-subsidisation and what are seen to be the relevant issues, especially whether some road user groups are paying 'reasonable' cost recovery charges.

> In addition, the paper reviews a few studies which have considered road pricing issues and cost recovery levels.

The question of the existence of, or possible implementation of, cost recovery in road transport is raised

INTRODUCTION

The road network continues to play a major and, undoubtedly for many more years to come, an irreplaceable role in the social and economic affairs of Australia Valued at approximately \$90 billion it is an essential national asset

The importance of the road network to the economic well-being of the nation and the fact that governments place ever increasing reliance on revenue generated from petroleum excises is undisputed. In fact it could be argued that the issue of road funding is closely related to the issue of cost recovery.

But, what is cost recovery? To my mind, cost recovery means recovering the costs expended upon a particular project. In road transport this equates to recovering the monies spent on maintaining, upgrading and building roads The relevant questions asked nowadays are who should the Government recover from? And, how much should the Government recover?

In essence these questions translate to how much should Governments recover from motorists, cyclists, bus operators, pedestrians, the road transport industry and the community generally.

In addition, in response to Australia's economic difficulties, governments are attempting to reduce expenditure on current programs and are subjecting all proposals for new expenditure to rigorous cost benefit analysis. This is having a major impact on the maintenance and development of Australia's infrastructure. The question of cost recovery for these types of expenditures has consequently become a major issue.

Two central themes have emerged, viz charge those whose demand for the road system is unaffected to a large degree by price, and secondly attempt to address the issue of road damage and use of the system.

The issue is further confused by the introduction of questions of equity and efficiency. Equity referring to fairness and what is just, whilst efficiency refers to the utilization of resources in the most effective manner to maximise the net benefits. In this case when the use and charges of the road system are divided amongst the users in such a way that no one person could be made better off without making another worse off.

In fact the issue of cost recovery has only been questioned over the past 10 or so years, and was highlighted in 1979 by the long-distance truck drivers blockade in NSW.

This paper cutlines the 'history' of cost recovery and reviews the major issues involved in the discussion of cost recovery to date.

HISTORY OF COST RECOVERY

In any discussion of cost recovery it must be remembered that governments in Australia initially adopted the attitude that the emergence of road transport was a very real threat to their established rail networks. Thus, regulations were designed and implemented which effectively prevented rail from losing its pre-eminent role as a land based carrier. As a consequence the rate structure of the railways has had an enormous influence on the domestic freight market. The subsidization and protection afforded rail has resulted in significantly large deficits on Australia's public transport systems.

Under Australia's current economic woes we continue to suffer severe penalties through congestion and delays with subsequent waste of financial resources, unnecessary usage of petroleum products, unnecessary air and noise pollution, avoidable deaths and injuries through traffic crashes and the deleterious effects incurred through the impact of increased through traffic.

One reason given for incurring these penalties is that the "pie" is just not large enough to allow funds to be directed to the road network.

The basic reason for our failure to build roads when they were needed has been the low priority accorded to roads in the allocation of funds, particularly by the Federal Government, and the fact that there are "no votes in roads".

By contrast Governments have not shown any reluctance to tax motorists to pay for the other services they provide for the general community

Despite all the investigations by State authorities, the Commonwealth Bureau of Roads, the Bureau of Transport Economics and other organisations, despite the continuing loss of life and tragic injuries, despite the constant burden on the productivity of the nation, successive Federal Governments have refused to acknowledge the need for a more realistic level of spending on roads.

For many years the importance of an adequate roads network has been discussed and note taken of Australia's "critical reliance on the motor vehicle" and the problems associated with our small but highly concentrated population with an overall low population density and large intercity distances.

These discussions have identified that

- an adequate road system is vital to Australia's needs
- the situation is deteriorating annually relative to increased needs

- the inevitable result of an inadequate road system is increased costs reflected through all sections of the community
- good roads are a vital link in our defence system
- good roads are essential in encouraging tourist traffic
- the consumer is paying for better roads which are not being provided - i.e. an argument for acknowledgement of higher cost recovery levels
- roads are a national asset and it is the responsibility of the Commonwealth Government to provide the necessary funds for essential road improvements
- there is growing unrest among motorists about Australia's sub-standard road system expecially in their knowledge of the very large sums of revenue being appropriated by the Government in petrol excise and as a result of its crude oil pricing policy.

A brief outline of recent history will hopefully explain the rationale behind not achieving the positive benefits of a more equitable and efficient road charging system.

In 1975 the National Association of Australian State Road Authorities (NAASRA) conducted the Study of the Economics of Road Vehicle Limits (ERVL) which generated most of the following years debate and investigation into cost recovery issues

The ERVL study found that

- overloading was very significant, particularly on multiple axle groups and generally extended to all states
- . _ non-observance of articulated vehicle dimension limits was common
- the degree of enforcement and the resulting penalties are both low. Many operators regarded fines as part of their normal operating costs
- little attention was paid to the inspection of the mechanical condition of commercial vehicles
- the cost benefits to be gained from increasing payload capabilities accrued largely through savings in drivers wages and vehicle depreciation rather than direct running costs

ERVL did not attempt to address the cost recovery issue itself

However, it should be noted that some pricing issues had been raised previously but were related to specific examples such as bridge tolls and road tolls.

Prices alone were unable to determine optimum solutions to transport

problems. It was found that transport services such as reliability, convenience, safety, time and comfort often interacted with price.

It was not until two years later at the Science and Industry Forum of 1978 that discussion on the pricing of transport services was introduced and cost recovery superficially examined

In February 1977 a committee to Evaluate Alternative Road Pricing Schemes was formed to advise the Australian Transport Advisory Council (ATAC) on the implementation of feasible and practical alternatives to the system of road charges currently used in Australia

The Committee found that one of the most essential parts of their investigation was the establishment of the levels of separable costs for the different vehicle types, and that the most efficient method to derive these estimates for commercial vehicles would be to use NAASRA'S ERVL Study.

The Committee concluded that total separable pavement costs for the arterial road system were considerably in excess of the revenue collected by the then Road Maintenance Charge (RMC)

In addition, a significant proportion of the potential RMC revenue was foregone by goverments because of exemptions and evasion

As can be seen from the above, seperable costs became the principle problem area. However, it should be noted that the so-called joint costs were also causing headaches. Who should pay for traffic hardware?, What about signposts? etc.

Most of us have been aware of the inequities between the charges that motorists have to pay for the use of the road network and the charges that the truck industry pay. That is, the heavy transport sector does not make an equitable contribution to the upkeep and improvement of the road network. However, the question of why this is so should be considered.

The question of a user pays system for Australia has been considered by several relevant studies including

Equity in Road User Taxation and Charges in Australia by I.R. Ker

Commercial Vehicle Costs and Charges - A Study of Separable Pavement Costs by Webber, Both & Ker

Pricing Tasmania's Roads by Taplin

Although these studies were undertaken several years ago they still hold some relevance to todays problems of achieving some form of cost recovery. It should also be noted that the above list is not exhaustive.

Appendix 1 provides some comments on these papers.

For comparative purposes it might also be useful to look at what New Zealand has done in the area of cost recovery. New Zealand has in fact introduced a system of taxing heavy commercial vehicles for the use of roads The system is based on the 'user pays' principle and has the following objectives:-

to structure the taxation system on heavy motor vehicles as an instrument of transport policy

- to act as a component in a system providing a realistic competive climate for road and rail
- to base the taxation system on a principle of 'user pays' in other words to ensure that the user of the roads pays for the amount of the use made of the roads and for the cost this use imposes on the road network
 - to provide an assured source of income to the National Roads Board to meet its expenditure on roads

Under the Road User Charges Act, taxes paid by heavy vehicles are directly related to the costs which these vehicles impose on the road infrastructure according to the amount of use made of the road (ie distance travelled), the laden weight of the vehicle and the axle arrangement

However, what has Australia achieved? Our first attempt at redressing the imbalances in our road system was to hold the National Road Freight Industry Inquiry (NRFII).

The following points were highlighted by this Inquiry:

- heavy transport sector does not make a fair contribution to the costs of the road network and is responsible for a high proportion of the costs of maintaining the road network.
- there are disagreements over the appropriate theoretical base for determining road user charges, including the problem of identifying and allocating individual costs to particular classes of users
- to ensure equity among all classes of road users and to promote economically efficient use of roads, all road vehicles should be charged according to the costs they give rise to, i.e. a user-pays system.
- formally hypothecate the revenue from road user charges to road expenditure
- governments should carry out a very thorough study of attributable and joint costs and the allocation thereof to different vehicle classes

In 1985 the Inter-State Commission (ISC) investigated Cost Recovery Arrangements for Interstate Land Transport and found:-

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- there were inequities in cost recovery and funding levels between road and rail
- there was a vast inequity between road revenues and road funding
- heavy vehicles do not pay their way
- rail is heavily subsidised

1986 saw NAASRA undertake the Review of Road Vehicle Limits (RORVL).

As was expected cost recovery was a major issue of the RORVL study. I think it is fair to say that a lot of people disagreed with the RORVL Working Party recommendations on the cost recovery mechanisms considered and argued that the methods identified were inadequate measures of road damage compared with other options which were available.

In fact the RORVL study is being criticised by parties involved in the cost recovery debate because it is perceived to be incomplete, its data is suspect and its methodology raises more questions than it answers. However, it is the only source of current information from which an investigation can be undertaken.

REVIEW OF COST RECOVERY

The question of implementing cost recovery measures on road users appears to be politically unpalatable. Should cost recovery be based on equity? That is, should cost recovery be based on what use the road user makes of the road system? There can only be one answer to these questions - YES.

No matter which way we look at this problem, if a road user is forced to pay for something which he does not get then he is being cheated and stolen from. Yet if the road user is receiving something for nothing he laughs all the way to the bank and thinks what suckers the 'others' are.

The current situation breeds resentment and discontent. Governments have allowed a system of price discrimination to set in, in fortifications which appear to be almost insurmountable

What then, may you ask, is the solution?

Various studies have identified that heavy vehicles do not pay their way and cause far more damage to the road system than the motor car. Clearly car owners subsidize the construction and maintenance of Australia's roads to the benefit of the road transport industry.

On the other hand, the road transport industry has argued that they more than pay their way, due to the imposts such as sales tax and import duty which are payable on various aspects of operating a heavy vehicle.

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Unfortunately the industry associations, and perhaps even the members themselves, fail to recognise that such imposts have nothing to do with cost recovery. Admittedly they are costs borne by road users but they are taxes which are either industry protection measures or general revenue raisers.

It is clear that if the cost recovery debate is to be more informed and constructive then Government must step in and define the relevant charges and revenue mechanisms - and themselves be fair and just in their assessment. This has not always been the case.

In addition there is further discrimination between interstate and intrastate operations which is also inequitable - especially if Government is honest in its moves to improve cost recovery arrangements in land transport.

The Inter-State Commission stated in its report "An Investigation of Cost Recovery Arrangements For Interstate Land Transport" that the ultimate goal is a set of charges which fully reflect road damage costs by vehicle class, regardless of whether such damage is caused in interstate or intrastate transport. The Inter-State Registration Charges set by that Inquiry can only be considered the first step towards implementing an adequate cost recovery charge. The current levels of charges still result in significant under-recovery of costs for heavy vehicles (including buses). If low levels of rail cost recovery remain an impediment to the setting of equitable road user charges then the Government should continue to seek increases in rail cost recovery.

Full cost recovery can only be achieved step-by-step, but progress in this matter can only be made if current inequities are abolished

In addition, an area of major concern has been the lack of implementation of cost recovery measures arising from some, but not all, States increasing vehicle mass limits. The costs arising from increased mass limits are substantial.

A METHOD OF COST RECOVERY

The discussion so far has been fairly general, however the specifics of any methodology for implementation of a system of cost recovery will no doubt be controversial. I have already mentioned some problem areas, eg equity vs efficiency and separable vs joint costs. There will be others.

At present the method(s) of cost recovery used by government is essentially not related to road use nor to road damage. Principally, fuel excise and registration fees are used to raise revenue from road users. The use of sales taxes, import duties and stamp duties are, or at least should be, considered general revenue raisers.

To determine an appropriate cost recovery system three aspects need

to be decided upon, viz the level of costs to be recovered, the allocation of these costs among road users and the determination of the relevant revenues paid by the road users.

The level of costs to be recovered is arbitrary but one can assume that governments will aim for at least 100% recovery. Any discussion of allocation of costs always generates heated debate. Yet economic theory tells us that the appropriate policy is to charge a price set at marginal cost for each user. Each user will effect a different cost on the road system, but it would be administratively inefficient to attempt to calculate individual prices. Hence the use of relationships and generalisations have become necessary. In addition the theory does not explain how such a system can be implemented equitably, especially since there is now general agreement that road users should pay for the damage they cause the road network.

The third part of the equation, the relevant revenues, is an area in which some sections of the road transport industry are lobbying intensively, but fortunately are not being taken very seriously. In fact, the industry's arguments on relevant revenues are unsupportable.

However, the aspect of most concern is the method of allocation of costs.

Let us assume that we are going to build a road network from scratch and that it is to be fully paid for by its users. For simplicity let us also assume that the road will be a single lane road and that we can ignore the costs of kerbing and traffic regulation devices. Initially, there is no trucking industry and no heavy vehicles.

Hence if one kilometre of "ordinary" road is built such that it can withstand the passage of "ordinary" motor vehicles then it is a simple matter to determine the average standard cost of the road.

If heavy vehicles are now introduced, we would need to build a road designed for the passage of the heaviest vehicle. Hence it would also be possible to determine the average standard cost of this road.

Bridge costs would also be determined in a similar way.

This sort of argument would enable the determination of joint costs as well as the separable costs by vehicle type. The additional costs of kerbing, traffic lights etc could then be determined on a joint cost basis for administrative simplicity.

If consideration is now given to the introduction of more than one lane then other determinants, such as travel time savings, reductions in crashes etc would need to be taken into account

One solution would be to build one lane for all vehicles and another lane just for motor cars. Occasionally, this second lane would need to be built to withstand overtaking manœuvers of heavy vehicles and costs allocated accordingly.

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If such a road system is deemed administratively complex then building all lanes to the highest possible standards would result in higher than necessary costs to the road transport industry.

Another solution is to try and use information from the recent RORVL study. The RORVL study considered the increased road damage costs resulting from increasing vehicle mass limits, that is the marginal costs, and found for example that the total additional Equivalent Standard Axle Load (ESAL) kilometres in NSW over 30 years, and using a relatively low growth rate estimate of 3% per annum, was 8295-375 million. Unfortunately, this figure excludes both local and inner urban roads.

RORVL further estimated the additional costs to the State Road Authority and Local Government Authorities in NSW per annum (in 1984-85 prices) at \$24.2 million. Of this amount \$6.7 million relates to necessary bridge costs which would be incurred in the first ten years.

The determination of a cost per ESAL-kilometre will therefore not be possible with any great degree of accuracy. However, assuming the cost of \$24.2 million is reasonable (if anything it is an under-estimate), then costs over the full 30 years will be \$592 million. Note that this cost excludes road damage costs to inner urban roads.

The road transport industry estimates that 12% of all ESAL-kilometres in NSW are incurred on local roads, hence the RORVL estimate would become 9290.82 million. This will result in a cost per ESAL-kilometre of 6.372 cents. I suggest that this figure is an under-estimate of the true marginal cost.

Using ISC estimates the cost of increasing vehicle mass limits to option A for a six axle articulated vehicle travelling 128,000 km per annum in NSW would be \$9,787 39 or nearly \$9,800.

That is, if cost recovery measures were implemented to recover just the increased road damage costs due to increasing vehicle mass limits for a six axle articulated vehicle in NSW, then the amount that would need to be recovered would be approximately \$9,800.

This analysis shows that the current road damage cost for such a vehicle would be approximately \$27,500 per annum. Taking fuel excise costs into account it would appear that an interstate registration charge of \$600 is grossly inadequate.

The following table provides indicative costings for other heavy vehicles in NSW:

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| VEHICLE TYPE | ES BASE | AL'S OPT A | INCR | DISTANCE KM | ROAD DA OPT A Ş | MAGE COSTS CURRENT Ş | 5 **.* |
|---|------------|---------------|-------------|----------------|-----------------------|----------------------------|-----------|
| RIGID | | | 1. S. A. | 1. A. A. | | | |
| -2 AXLE | 2.15 | 2.91 | 0.76 | 31,000 | 1,501 | 4,247 | |
| -3 AXLE | 2.48 | 3.36 | 0.88 | 52,000 | 2,916 | 8,217 | |
| 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - | | | | | | | |
| ARTIC. | | | 6 T A 1 T 1 | 5 C 2 C 2 | | ta esta da ser de la | |
| -3 AXLE | 3.30 | 4 47 | 1.17 | 128,000 | 9,543 | 26,915 | |
| -4 AXLE | 3.63 | 4.92 | 1.29 | 128,000 | 10,521 | 29,607 | |
| -5 AXLE | 396 | 5.37 | 1.41 | 128,000 | 11,500 | 32,298 | |
| -6 AXLE | 338 | 4.58 | 1.20 | 128,000 | 9,787 | 27,568 | |
| | | | | | | | |

ROAD DAMAGE COSTS FOR HEAVY VEHICLES IN NSW

These estimated road damage costs will be significantly higher if adjusted to todays prices.

CONCLUSIONS

The costs outlined above indicate that cost recovery is a dream which will never come to fruition under the present taxation regime. Consensus will never be achieved and any compromise solution will continue to only deliver a fraction of what is actually required.

Government must accept its role and provide the impetus and the groundwork for the determination of an appropriate cost recovery methodology. That is to say it must admit, once and for all, what charges are imposed for cost recovery purposes and what charges are imposed for general revenue or other reasons.

Government must also aid in the determination of appropriate costs for allocation between separable and joint costs as well as between different vehicle types. Any equivocation in these areas will only result in further deterioration of our road network.

ACKOWLEDGEMENTS

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COMMENTS ON COST RECOVERY STUDIES

1. Equity in Road User Taxation and Charges in Australia by I.R. KER.

This paper deals with the taxes and charges related to road use paid by the owners of vehicles in each of three vehicle categories - private, light commercial and heavy commercial - and the relationship between these amounts and the costs incurred in the construction and maintenance of the road system.

The main issues of concern in the study were those of equity between different vehicle categories and between the same vehicle types in different States. However, to a lesser extent it examined the question of road track costs and the extent to which vehicles cover the direct costs they impose.

Ker identifies the major problem with cost allocations studies for roads (which is recognised by all other authors) which is the allocation of joint costs i.e. those costs which are incurred on behalf of all vehicle classes. Optimum charges should be based on the level of seperable costs i.e. those costs which are incurred by the use of the road by a particular class of vehicle. These costs by definition will be less than total costs and it is therefore necessary for any system to devise a satisfactory method for the allocation of joint costs.

Another major problem area is in the definition of what constitutes road user taxes and charges, a subject of much debate and argument.

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APPENDIX 1

Ker's study was not based on seperable costs and thus he claims the results cannot be used to justify higher taxes on heavy commercial vehicles. Nevertheless, the study showed that private vehicles pay the greatest amount in proportion to allocated costs and heavy commercial vehicles pay the least which provides strong prima facie evidence that a readjustment of road user charges is warranted.

2. Commercial Vehicle Costs and Charges: A Study of Seperable Pavement Costs by Webber/Both/Ker

This study produced figures for seperable pavement costs for heavy vehicles and compared these figures with the tonne-kilometre formula used in the Road Maintenance Charges effective at that time. Analyses were conducted at both an Australia wide and individual State level. The seperable maintenance costs on the arterial road system attributable to commercial vehicles were estimated to be about \$225 million per annum in 1976-77 prices. This cost equates with a cost for rigid trucks of 0.22 cents/tonne km and for articulated trucks of 0.30 cents/tonne km. These costs compare with the RMC charge applicable at that time of 0.17 cents/tonne km of assessed mass.

The paper concluded that total seperable costs for the arterial road system are considerably in excess of the revenue collected by the RMC and further than even when fuel duty payments are added to road maintenance charges articulated vehicles are seen not to cover the full seperable costs of their operation the shortfall being greatest with the largest vehicles

It should be noted that the seperable cost analysis only considered trucks and has been limited to analysis of pavement costs on the arterial road system. No allowance was made for other construction and maintenance costs associated with truck turning manoeuvres, truck passing lanes, lower vertical grades for trucks and bridge costs.

Finally, the paper referred to the New Zealand system of road user charges for heavy commercial vehicles and stated that the system goes a long way towards meeting the criteria set out in the paper and in recent reviews of road user charges

3. Pricing Tasmanias Roads by Taplin

This study examines the question of pricing Tasmania's roads. The report attempts to deal with the theoretical difficulties by approaching the problem in two stages. First it establishes how much of the road system costs are made up of true marginal costs of road user i.e. the cost which an additional vehicle kilometre imposes on the road system. Then the excess over these costs to make up total costs are attributed according to the inverse-elasticity rule i.e. by the capacity to pay or what the market will bear. This means that the less elastic demands are those which will scarcely be suppressed at all by higher charges and so will have relatively high charges imposed on them. Thus, the pattern of activity, particularly travel and transport, will be distorted as little as possible if the recovery of road costs is carried out in this way.

It is worth quoting extensively from the Taplin study:

"The greatest weakness of the present system is that motor tax per vehicle-kilometre tends to be less for larger trucks than for smaller. The fact that this tax is a fixed annual sum is itself an inducement for larger trucks to do more kilometres, but it is a relatively minor one. A large truck is an expensive item of equipment and the owner will normally ensure that it is utilised as fully as possible. Because such a vehicle already does a very large number of kilometres.

Although motor tax is a suitable method of achieving the cost recovery appropriate to each type and carrying capacity of truck, it has the drawback that it can only be set to the average performance of each of these. Charges would be better related to the actual work done by each vehicle. Permit systems are unsatisfactory because they are administratively cumbersome. Far preferable would be some type of automatic and tamper-proof device for recording distance. This is being done successfully in New Zealand where the truck is fitted with a hubodometer (Working Party Report, 1979). The operator buys successive distance licences, at a rate appropriate to the gross weight and configuration of the vehicle, and must possess an unexpired licence (i.e. with unused distance) at all times.

Fuel taxes have the merit that tax paid varies with the use of the road. However, their incidence is not proportional to the appropriate cost recovery charges. In the case of cars, any increase in tax becomes an additional consumption tax rather than road cost recovery.

This is not necessarily objectionable but there is the problem that cost recovery cannot be increased selectively from the vehicles which ought to pay more. In general, a higher tax on diesel fuel than on petrol would improve the relative incidence of charges between heavy and light vehicles, but widening the tax differential would eventually lead to more petrol powered heavy vehicles."

These three reports firmly establish the case that heavy vehicles are a not paying an adequate amount for the use of the road system.

In addition there is a significant degree of over cost recovery from the private vehicle sector.

There was also general agreement that the New Zealand system of road user charges goes a long way towards meeting many of the theoretical economic equity and efficiency criteria and additionally is efficient in an administrative sense.