



## Promoting the use of rail freight services

**Margaret Starrs and Ted van Geldermalsen**

*MM Starrs Pty Ltd, Maunsell Australia Pty Ltd*

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### Abstract

Many governments have objectives which are aimed at increasing the use of railways to carry freight. These objectives often lack supporting policies which enable the achievement of the objectives. The paper considers the policy alternatives by reference to some schemes in other countries and a case study in Victoria. Freight is largely provided within a competitive model by private transport companies which means that commercial considerations drive investments.

This is not the case for road infrastructure which is assessed on an economic basis. This may lead to inconsistency in the treatment of rail and road and mean that freight is not carried on the lowest cost mode. In addition, there are market failures in road transport because not all costs are internalised. These factors appear to provide a justification for some government intervention including financial support to rail freight operators to enable them to win traffic from trucks.

The matters covered in the paper include discussion of who should receive financial support (eg individual applicants, award through a tender process), access to infrastructure provided, how the level of any financial support should be determined (eg the determination of economic worth, returns from the financial support, the community benefits of the removing freight from road to rail), and the mechanisms for the delivery of any support payments (eg up front grants, continuing annual assistance).

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### Contact author

Margaret Starrs (Miss)  
MM Starrs Pty Ltd  
6 Arthur Street  
South Yarra VIC 3141  
Tel 03-9826 3742  
Fax 03-9826 3751  
E-mail: mstarrs@ozemail.com.au

Ted van Geldermalsen  
Principal Transport Economist  
Maunsell Australia Pty Ltd  
Level 9, 161 Collins Street  
Melbourne V 3000  
Tel 03 9653 2651  
E-mail:  
ted.van.geldermalsen@maunsell.com.au

## **Introduction**

Many governments have objectives which are aimed at increasing the use of railways to carry freight. These objectives often lack supporting policies to enable the achievement of the objectives. This paper considers possible policy alternatives by reference to some schemes in other countries and a case study in Victoria.

Freight services are largely provided within a competitive model by private companies which means that commercial considerations drive investments. This is not the case for road infrastructure which is assessed on an economic basis. This may lead to inconsistency in the treatment of rail and road and mean that traffic is not carried on the lowest cost mode of transport.

In addition, there are market failures in transport because not all costs are internalised. The size of these market failures varies between modes. For example, generally rail is safer and has less impact on the environment than road transport, and there is also debate about whether charges paid by all trucks for the use of roads are sufficient to cover the costs of their road use.

These factors appear to provide a justification for government intervention. The best solution from an economist's point of view might involve addressing transport pricing, which would seek to ensure that prices charged to freight customers reflected the relevant externalities imposed by each mode. As pricing solutions are difficult politically, and in some cases practically as well, there appears to be justification for considering the alternative of providing financial support to rail freight operators to enable them to compete with trucks on a more equal basis.

The matters covered in this paper include discussion of:

- who should receive financial support (eg negotiation with individual applicants, or use of a tender process);
- access to facilities which receive financial support;
- how the level of any financial support should be determined (eg the determination of economic worth, returns from the financial support, the community benefits of diverting freight from road to rail); and
- mechanisms for the delivery of any support payments (eg up-front grants, continuing annual assistance).

## **What others do**

There are financial assistance schemes for the carriage of freight by rail with clear objectives and procedures in New Zealand and the United Kingdom. These schemes are outlined below.

## New Zealand

Transfund New Zealand (Transfund) allocates central government road funding for State highways and local roads. The legislation creating Transfund defined its principal objective as being “to allocate resources to achieve a safe and efficient roading system”. A clause in the legislation (Section 3D) outlined the powers and functions of Transfund in relation to alternative forms of transport. This clause allowed Transfund “to fund outputs that consider or develop efficient alternatives to the provision and maintenance of roading”. “Alternatives to roading” (ATRs) were considered to include passenger transport services and facilities (including rail, harbour ferry, and bus options), and freight services and facilities (including rail, and coastal shipping and barging) (Transfund 1997). Our discussion focuses on the rail freight aspects of the policies.

Applications to Transfund for ATR funding can only be made by regional and local councils. Private sector proponents must first obtain the support of relevant councils who will assist with the preparation of proposals and submit them to Transfund. Proposal can also be initiated by councils.

The policy covering ATRs comprises four components.

### *Financial Evaluation*

The first step in considering a proposal is to confirm the size of the “funding gap”. The funding gap is the amount of financial assistance (subsidy) required for the proposal to be financially viable for the service provider. The proposal should include a financial analysis showing the proponent’s assessment of the funding gap. This is reviewed by Transfund, with a particular focus on the validity of cost estimates, revenue forecasts, and the appropriateness of the required rate of return used to discount the forecast cash flows. This review is made difficult for rail freight proposals in New Zealand by the fact that a single company owns the rail system including track and operations, and it has been reluctant to provide information about its costs. The outcome of this step is a confirmed or revised funding gap estimate.

### *Economic Evaluation*

Once the size of the funding gap has been confirmed a form of economic evaluation is performed. The result of this is presented as an “efficiency ratio”. The numerator of the efficiency ratio contains the benefits to users of the ATR service, road user benefits and externalities. The denominator contains the government costs and cost savings. These include the required subsidy that is to be paid by road agencies (Transfund and/or local council(s)) less road construction and maintenance cost savings. Service provider (rail operator) revenues and costs are not included in the efficiency ratio. There are standard rates for valuing externalities that are also used in the economic evaluation of road projects.

To qualify for funding, a proposal needs to have an efficiency ratio greater than Transfund's funding cut-off benefit/cost ratio (BCR) for road projects, which at the time the policies were developed stood at 4.0.

Several features of the policy were necessary because of the institutional arrangements in New Zealand, legal opinions about what was permitted by Section 3D, and funding limitations that result in the relatively high cut-off BCR for road projects. Some of these features would be less relevant in jurisdictions without common transport funding arrangements.

For example, if Transfund had sufficient funds available to fund all projects with BCRs over 1.0 a BCR could be calculated instead of the efficiency ratio. Also, if the requirement that public funding for rail freight proposals must achieve the same economic return as road expenditure was relaxed to just require that such proposals are economically efficient (ie have a BCR greater than 1.0), a BCR could also be calculated instead of the efficiency ratio. The main reason for not adopting this latter interpretation was because the funding for road projects and ATRs all came from the National Road Fund which is a dedicated fund, financed entirely from road user taxes and charges. It was considered inappropriate to use funds obtained from road freight operators to subsidise rail projects that gave a lower economic return than if the funds were allocated to the next most economic road project (with a BCR just below 4.0).

#### *Financial assistance*

This part of the policy determines who contributes, and in what proportions, the subsidy for the ATR proposal once it has been approved for funding. In the case of rail freight proposals, the main likely contributors are Transfund and local councils (which both could save road maintenance costs). The benefits and government cost savings calculated in the economic evaluation are attributed between the agencies based on which agency normally meets those costs in the case of road projects. Responsibility for funding the subsidy amount that is to be paid to the service provider is then allocated between these agencies in the same proportion as the incidence of the benefits (Transfund 1996).

Transfund ATR financial assistance payments are only made to regional and local councils. The councils have the direct relationship with the service provider.

#### *Competitive Pricing Procedure*

The legislation specifies that Transfund can only provide funding if prices of projects have been determined by a competitive pricing procedure. This is reasonably practical for road projects and public transport subsidies where there is a competitive provider market. In the case of rail freight, where there is only one service provider, a "sole supplier" competitive pricing procedure was developed. This procedure involves negotiation, benchmarking, and as much disclosure of costs as is justified in each particular case. The administrative

costs incurred in this procedure could be reduced if a competitive market existed for provision of rail services.

The legislation specifies that Transfund can fund ATR "outputs". Initially this was interpreted as meaning that funding could only be by way of on-going payments conditional on the ATR outputs continuing to be provided. This interpretation was subsequently relaxed to allow some up-front funding for capital projects. It is believed that the reason for initially excluding lump sum contributions to capital projects was to maximise the incentives on private sector service providers to ensure the on-going effectiveness of ATR initiatives.

The New Zealand government made changes to transport funding legislation in February 2002 that were intended to make it easier for alternative modes to qualify for central government funding.

### United Kingdom

Grants to encourage freight to be carried by rail and water have been available for some time, with an extension of the scheme at the time of rail privatisation. There are two grant schemes for freight railways to reflect their environmental and social benefits over road transport:

1. The Freight Facilities Grant (FFG) is designed to enable freight to be attracted to rail and to maintain existing rail traffics. Funds are available as one-off grants for the capital costs of new freight handling facilities, improvement of existing facilities or re-opening dormant facilities.
2. The Track Access Grant (TAG) is available to railway freight service providers for the payment of up to 100 per cent of track access charges, paid monthly in arrears.

The FFG has been available since 1974 while the TAG was introduced in 1996 in association with the privatisation of British railways. Current allocations are about £50 million per year, with an approximate 80:20 split between the FFG and the TAG (SRA 2001a). (In the 5 years following privatisation, the split was reversed in favour of the TAG as part of the Freightliner privatisation arrangements that included payment of all track access charges.) Privatisation and government policy to encourage the use of rail were associated with a significant increase in grants which averaged about £4 million per year in the prior 20 years (SRA 2000).

A grant is available if it can be shown that the freight would go by road if the facilities were not provided or the full track access charges had to be paid, and that it is in the public interest for the freight to be carried by rail. The public interest criterion is met if environmental or social benefits will occur if rail is used. A cost-benefit analysis is not required so that it is possible that grants could be paid to switch freight from road to rail when that is not the preferred option when all costs and benefits are considered.

Organisations applying for both types of grants are required to provide a financial assessment (discounted at 10 per cent) which shows that revenues are less than costs, and evidence that the traffic would go by road in the absence of the grant (SRA 2001b). The financial assessment includes traffic forecasts that are used to estimate road and rail revenues, and the rail loss. Grant seekers are also required to provide other relevant information, eg benefits to others from the rail facilities, proposed financing arrangements, non-financial benefits such as speed and reliability. Generally firm commitments for rail carriage are required for the FFG, while a grant for track access charges is only made if confirmation from the access provider is given that rail was used.

Environmental benefits are valued by applying standard rates per mile on different road types. The rates are multiplied by the road length and number of truck trips per annum to obtain an annual benefit. The annual benefits are discounted over 10 years at 6 per cent to obtain a present value of the benefits. This becomes the maximum amount of any grant. Other factors taken into account in deciding on the amount of the grant are:

- the amount required for diversion of traffic to rail indicated by the financial assessment;
- the size of the investment, with the costs independently verified; and
- in the case of TAGs, the track access charges.

The Strategic Rail Authority (SRA) assumed administration of the grant programmes in early 2001 and is currently reviewing some aspects to streamline the administration process. Assessment of grant applications takes about six months, even though the grant seeker is required to prepare most of the information in the form of the financial assessment. Options being considered are less onerous application requirements for smaller grants, and whether grants should be made when traffic is not committed to the use of rail. With respect to grants to pay track access charges, a scheme to pay charges for certain classes of traffic at a set rate per tonne is under development, with intermodal traffic being the first traffic class under consideration. The standard rates for valuing environmental benefits are under review.

## **Australia**

There are no formal schemes (like those described above) providing assistance to promote the use of rail to carry freight. Nevertheless, some assistance is provided by governments, either explicitly or implicitly. In many cases it is not clear what the objectives of the assistance are or when assistance may be available. This is arguably important when most rail freight services are provided by private companies if governments are to achieve their objective of switching freight from road to rail.

Some types of assistance to rail infrastructure providers and operators are listed below. The list is not comprehensive, but provides some indication of the types of assistance available.

- As part of the privatisation of V/Line Freight in Victoria, the cost of then existing infrastructure is not priced. The access charges effectively cover only maintenance and operations costs, and the cost of any new infrastructure.
- The NSW government paid \$328 million in Community Service Obligations (CSOs) and \$28 million in capital grants to rail access and freight service providers in 2000/01; no information is given on the purpose or basis of the payments or the services/lines to which they apply (NSW Department of Transport 2001).
- The Queensland government pays \$1.5 billion under a CSO contract with Queensland Rail to provide and maintain infrastructure that would not be provided on a commercial basis; it is not clear whether economic benefits justify this level of expenditure (Queensland Transport 2001).

The Queensland Rail Network Strategy reports an investigation of transport mode for the carriage of magnesium from a mine to a processing plant in central Queensland (Queensland Transport 2001). The investigation had the objective of enhancing the role of the rail network and reported that on a commercial basis road was the preferred mode of transport, but when externalities were included road and rail costs were similar. This appears to have a similar basis as the approaches to promoting rail in the United Kingdom and New Zealand discussed above.

### **Case study**

A recent study the authors undertook for the Victorian Department of Infrastructure assessed a preliminary proposal for the rail transport of sand (used in construction works) over relatively short distances to locations in the Melbourne metropolitan area. The proponents had requested financial assistance from the government for facilities to establish operations and to pay track access charges. Our role was to provide the framework for the preparation of a draft business plan and assist the proponents in developing their business plan, as well as to provide the Department with an evaluation method, and advice on the broader economic merits of the proposal and whether Government financial assistance was justified.

The proposal was entrepreneurial in that the proponents had no firm contracts to carry sand, but considered that if they could offer rail rates 10 per cent below road rates they could capture traffic from trucks. The study also provided advice on the assessment of assistance to encourage rail transport more generally. (The study report has not been released because it contains financial and technical information about the proposed rail transport operation. At the time of writing this paper, the proponents are still refining their business plan to address all of the factors identified in the study report and have yet to submit a formal proposal to the Department.)

The assessment procedure comprised three steps.

#### Financial analysis

The first step involved assisting the proponents to prepare a financial analysis or draft business plan for the proposed rail operation, including the total costs to get the project started and the annual operating costs. The proponents had prepared some financial data but as the proposal was somewhat fluid they had not completed a formal business plan, as would be required by the United Kingdom and New Zealand grant schemes. There were no revenues because this was an entrepreneurial proposal, but there was a figure for the financial assistance requested based on the proponents' beliefs about the revenues likely to be achieved. As part of our analysis, the costs were converted to costs per tonne of sand carried to compare with current road rates as a means of determining whether the project was financially viable. There are several sand resource areas serving Melbourne while the destinations for the sand are widely dispersed and road rates vary with truck types used and the type of operation. This meant that the comparison with road rates could not be definitive as the actual position would be affected by the origins and destinations of the sand and the truck operations.

If the proposal was financially viable, then no further investigation would have been required to determine whether there was an economic case. If the proposal was not financially viable, then the operating loss could be used to provide an indication of the level of government funding required to make the project viable. In this case, three of the options had marginal financial returns, indicating that the level of financial assistance requested by the proponents was in excess of that required for financial viability. Option 1 was clearly not financially viable; in this case due to the relatively short haul distance and low tonnage (see Table 1).

The proponents suggested that they required a rate of return of 15 per cent in the financial data which they provided, while our analysis used a rate of 12 per cent, comprising 8 per cent which has been used in setting rail access charges plus a 4 per cent allowance for risk. For the significantly more risky Alice Springs-Darwin railway, a rate of return of 18 per cent was sought in the access arrangements, although we understand that the operators are now considering using a rate of 16 per cent.

**Table 1 Options Investigated for Carrying Sand by Rail**

	Option 1	Option 2	Option 3	Option 4
Distance (km)	53	110	53	110
Tonnes pa ('000)	250	250	500	350
Financially viable	No	Marginal	Marginal	Marginal
Economically viable	No	Yes	No	Yes
Reduced externalities	Yes	Yes	Yes	Yes
Reduced externalities/ requested assistance	0.58	0.47	0.89	0.51

### Economic analysis

The second step was to undertake an economic analysis aimed at determining whether there would be an improvement in economic welfare if the sand was carried by rail rather than road. Costs and benefits were valued in resource terms, with community costs also included in terms of the externalities of road and rail use. The costs and benefits included rail infrastructure costs, sand terminal costs, truck and rail operating costs, savings in road maintenance costs, and truck and rail accident and environment costs. The analysis was undertaken on an annualised basis: Infrastructure was annualised over 30 years and plant over 15 years at a discount rate of 6 per cent. An economic case could not be made for two of the options because of the short distance of haul (see Table 1).

The economic analysis was strongly dependent on the unit costs used to value externalities of road and rail transport. As much of the transport occurred in the metropolitan area the estimated reduction in externalities was relatively high for all of the options. The unit costs were estimated from a range of sources as there are no standard parameter values available for use in cost-benefit analysis or other evaluations. As noted above, the New Zealand and United Kingdom schemes have specified values, with those of the latter currently under review.

Our procedure was different to that in the United Kingdom as an economic analysis was undertaken to determine whether rail is preferred to road on economic efficiency grounds. Even if the externalities associated with truck use are greater than those of rail, the use of rail may not be preferred as its total net benefits may be lower than those of road transport. In New Zealand only a partial economic analysis is undertaken because of the source of funds and the high BCR cut-off rate for road projects.

## Financial assistance

The third step was make some assessment of the level of assistance required to correct for market failures in road transport. Financial viability and the reduction in externalities were the main factors determining the level of assistance. The level of assistance required was taken to be the lower of the requested financial assistance and the difference in road and rail externality costs, as with the United Kingdom grant schemes. (As noted above, in three cases the requested financial assistance was in excess of the amount required for financial viability although it was not possible to be specific about the amount.) In all options, the requested financial assistance was in excess of the reduction in externalities, while Option 1 had a clear financial deficit and was not economically viable (even though it reduced externalities). This suggested that no financial assistance should be available for Option 1.

## **A Policy Framework**

Our analysis and the review of existing grant schemes aimed at promoting the use of rail led us to suggestions on the operation of a funding scheme to meet the government's objective to increase the use of rail to carry freight. This was in addition to the gain to the proponents in developing and refining their proposal and to the government's evaluation when the scheme is finalised.

## General procedure

The procedure would be as follows:

1. Determine the business case or the financial viability of a proposal.
2. If the proposal is financially viable, then no further investigation is required to determine whether there is an economic case and no subsidy is required.
3. If the proposal is not financially viable, determine whether there is an economic case for carrying the freight by rail.
4. On the basis of the financial and economic cases, determine the level of assistance required for the proposal to be financially viable and compare this with the level of assistance that is justified to correct for market failures in road transport.

The scheme should also specify the rate of return to be used in the financial analysis. The United Kingdom rate of return of 10 per cent is based on schemes with committed rail traffic, while we used 12 per cent for an entrepreneurial scheme. Some flexibility in the rate would be desirable to reflect different levels of risks.

### Application requirements

Applicants should be required to provide the details of their business case, clearly showing their need for subsidy to compete with road transport. In New Zealand where there is only one rail service provider full financial details have not always been provided. As the government is keen for more freight traffic to be carried by rail it has accepted this situation at an increased cost of assessing applications. The preferred situation would be to insist on full disclosure of costs and revenues, but in specific cases this may not be desirable if the potential reduction in externalities is large and the applicant refuses to do so.

Applicants would also need to provide estimates of the number of truck kilometres removed in urban and rural areas. These would then be valued using standard unit costs to estimate the value of the reduction in externalities, with the lower of the financial loss and the reduction in externalities being the maximum financial assistance justified.

There are no agreed unit costs to value externalities in Victoria and a large range of values reported in the literature. This is partly due to adoption of values from other countries which have very different road and rail environments to those in Australia. This area will require further research if a grant scheme is to proceed.

### Traffic risk

Requiring a firm financial analysis from grant seekers may preclude entrepreneurial schemes of the type we analysed. Separate arrangements seem to be required if these sorts of schemes are to be funded to ensure that traffic risks are not borne entirely by the government when it provides support. The method of payment of grants is one mechanism for risk sharing. An up-front payment implies that the government carries the risks while annual payments can be ceased if traffic does not materialise; the traffic risk is then moved towards the operator. It would also be possible to structure the financial assistance as a mixture of up-front and annual payments so as to provide an incentive to the rail operator to increase traffic by limiting the number of years of any annual payment.

The question of who bears the traffic risk is likely to be of less significance where respondents have firm commitments for the use of rail at agreed freight rates.

### Payment of financial assistance

The preferred method of payment will be affected by two other factors. Firstly, the type of costs for which financial assistance is requested by a rail operator. If the costs are of a capital nature then an up-front payment may be necessary to enable the operation to commence, while if the costs are of a recurrent nature annual payments would be more appropriate. This occurs with the United

Kingdom grants where the FFG is a capital payment for facilities and the TAG is an annual grant for track access charges. Secondly, from the point of view of the government, a lump sum payment has the advantage that there is no continuing involvement by government in what is clearly a commercial operation. Annual payments would require continuing budgetary provisions and may also require further assessments that payments continue to be worthwhile.

### Competitive tenders

A further issue to be considered is whether financial assistance should be provided to an operator without reference to any other operators. This is a more significant issue for an entrepreneurial proposal or one which involves facilities which could be used by more than one rail operator, as was the case in the proposal which we analysed. The government may not wish to provide explicit subsidy to a particular private operator without giving others the opportunity to compete for the subsidy. Some form of tender process may be warranted to give other potential service providers the opportunity to submit proposals for assistance. A request for tender would need to include the objectives that the government is attempting to achieve by encouraging rail use and ensure that the subsidy cost is minimised by the competitive process. A possible disadvantage of a non-exclusivity policy such as this is that it could discourage entrepreneurial proposals.

An alternative to competitive tenders could be to require a proponent receiving financial support to allow access to the facilities by other potential users. This would effectively create a common user facility and extend the range of infrastructure subject to access arrangements. This option has not been investigated in any detail but we note that it would require relatively complex arrangements between the government and the facility owner which may delay the switching of traffic from road to rail, eg access rights, access prices, treatment of improvements to facilities. The important point is that the scheme guidelines make clear when competitive tenders will be sought so that proponents are not required to prepare proposals unnecessarily.

For proposals where there is committed traffic there appears to be little reason for tenders to be sought. Indeed, it would be possible for several proposals carrying the same traffic to be funded so long as they met the scheme criteria. The level of assistance would be dependent on the financial and economic characteristics of each proposal.

### Administration

Other issues that need to be considered in the development of a policy on financial assistance for rail freight proposals include: institutional arrangements such as responsibility for administering the scheme and accountability for ensuring that it is achieving value for money; and budgetary implications such as how many proposals might be submitted, how much funding should be

allocated in anticipation of these, and how far funding commitments should extend into the future.

The above discussion suggests that the grant application and assessment process should have some flexibility with respect to information requirements from applicants and the type of assessment undertaken. The size of the grant and the level of traffic risk are the most significant variables in this regard. A relatively small grant for facilities where traffic is committed to the use of rail should be associated with the least requirements. The scheme we analysed required a relatively large amount of financial assistance, that financial assistance was requested for both capital and recurrent costs, there was no committed traffic, and some of the facilities had the potential to be used by other rail operators or shippers. A detailed analysis was required which is unlikely to be the case for many schemes seeking government assistance.

#### Incentives to use rail

Finally, the existence of a grant scheme with a specified level of funds to promote the use of rail could itself act as an incentive to encourage change in the behaviour of freight service providers. A scheme with known objectives, procedures and criteria for assessment provides a mechanism for a clear statement that rail is the preferred mode in certain clearly defined circumstances. This is likely to have beneficial effects by:

- providing a 'carrot' to focus on areas of special concern in freight transport, eg intermodal operations;
- encouraging transport service providers and shippers of traffic to consider rail when they would not normally do so;
- leading to proposals from organisations which have the day to day knowledge and experience in the freight business; and
- generating innovative approaches and solutions to transport problems.

We conclude that any funding scheme needs to be outcome oriented rather than providing blanket subsidies to specific modes/services, with allocation rules:

- based on criteria which ensure that the funds meet the objectives for which they are intended;
- providing a carrot to investment in rail facilities;
- specifying to whom funds may be available; and
- containing threshold values for projects to streamline the application and assessment process.

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