Road Transport Reforms - Implications for Rural and Remote Areas

Report

Concerns have been expressed that the introduction of a national system of road user charging for heavy vehicles could adversely affect transport operators, consumers and producers in rural and remote areas of Australia. This joint Bureau of Transport and Communications Economics/Australian Bureau of Agricultural and Resource Economics project estimates the impacts of changes to road user charges on vehicle operating costs and on selected industries in rural and remote Australia. The analysis indicates a diversity of impacts to be expected from any given change to current road user charges.

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ROAD TRANSPORT REFORMS- IMPLICATIONS FOR RURAL AND REMOTE AREAS

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FOREWORD

In 1991, the Commonwealth Government directed the Bureau of Transport and Communications Economics (BTCE), together with the Australian Bureau of Agricultural and Resource Economics (ABARE), to analyse the impacts of changes to heavy vehicle road user charges on the costs of transport, and the resultant impacts on people and industries in rural and remote Australia.

The Summary and appendix IV of the report address the implications of the *Heavy Vehicle Charges Determination* released by the National Road Transport Commission (NRTC) in June 1992.

For the BTCE, this report was prepared by Mr J. Asman, with the assistance of Messrs A. Chippindale and G. Murtough. For ABARE, chapter 5 was contributed by Messrs G. Barry and M. Foster and chapter 6 by Mr B. Allen and Dr N. Hall. The assistance of officers of ABARE's Survey section, especially Messrs P. Hibberson and L. Sissian, in the design and undertaking of the supplementary survey associated with chapter 5, is acknowledged.

The BTCE acknowledges the assistance provided to it by the State and Territory departments responsible for the transport and roads portfolios, by the eastern States' railway systems, by some road transport industry associations, and particularly by the remote area transport operators surveyed.

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July 1992

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ABSTRACT

Concerns have been expressed that the introduction of a national system of road user charging for heavy vehicles could adversely affect transport operators, consumers and producers in rural and remote areas of Australia. This joint Bureau of Transport and Communications Economics/Australian Bureau of Agricultural and Resource Economics project estimates the impacts of changes to road user charges on vehicle operating costs and on selected industries in rural and remote Australia. The analysis indicates a diversity of impacts to be expected from any given change to current road user charges.

SUMMARY

Introduction

The study that comprises the basis for this report was undertaken during the period late 1991 to early 1992. Preliminary results from the study were provided to the Minister for Land Transport and to the National Road Transport Commission (NRTC) in February–March 1992. With the release of the NRTC *Heavy Vehicle Charges Determination* on 22 June 1992, the opportunity was taken to extend the study's calculations to apply expressly to the NRTC recommendations. The results have been included, in brief, in the penultimate section of this summary and, in greater detail, in appendix IV to the report.

The summary provides a synopsis of the joint Bureau of Transport and Communications Economics (BTCE)/Australian Bureau of Agricultural and Resource Economics (ABARE) study into the impacts on rural and remote Australia of possible changes to road user charges.

Background

The study was undertaken at the direction of Commonwealth Government Ministers following consideration of the 1990 Interstate Commission report entitled *Road Use Charges and Vehicle Registration: A National Scheme*. Subsequent consideration of this matter by the Overarching Group of Commonwealth, State and Territory officials (OAG), by the 1991 Special Premiers' Conferences, and by the NRTC was a related development.

Methodology

The study employed the following sources of data and techniques:

- advice and information from each of the relevant Northern Territory, Western Australia, South Australia, Queensland, Tasmania and New South Wales departments of transport;
- data obtained from heavy vehicle operators serving selected rural and remote routes in each of the above States and Territory;
- an independent commercial truck costing model (Austway);
- statistics collected by ABARE on behalf of the Queensland Department of Transport, relating to the type and use of farm vehicles;

- the ABARE Agricultural and Grazing Industries Survey and a special supplementary survey of Northern Territory beef cattle producers; and
- an ABARE model of grain distribution in eastern Australia, updated to 1990–91 road, rail and port costs.

As a guide to the effects of any given reform of road user charges, the study investigated the likely impacts of seven alternative hypothetical charging scenarios. The scenarios spanned the range of charges that might conceivably emerge from the processes of road transport reform. Upper bound, lower bound and intermediate charges were considered in both fixed fee form and a distance based variant which was calculated to raise the same level of total revenue per vehicle class as its fixed fee counterpart. The charges considered were:

OAG Phase 1 *(flat fee)*
OAG Phase 1 *(distance based)*
OAG Phase 2 *(essentially distance based)*
Weighted average of State charges *(flat fee)*
Weighted average of State charges *(distance based)*
NSW charges *(flat fee)*
NSW charges *(distance based)*

Results

There is a diversity of impacts to be expected from any given change to current road user charges and concessions. These reflect principally the large differences between current State and Territory charges and large differences between vehicle operations, particularly annual distance travelled. While it is possible to make generalisations about the direction and magnitude of likely effects at the national or State level it should be noted that in most cases there will be important exceptions to such generalisations.

Impact on vehicle operating costs at the national level

Table A provides an indication of the range of impacts to be expected on full-time commercial vehicle operators in rural and remote areas, for all of the selected hypothetical charging options. The table identifies the vehicle type that is least affected, and the vehicle type that is most affected, in each State and Territory, by the average impact of the seven hypothetical charges. Because a given vehicle type can be among the least affected by one scheme and among the most affected by another scheme, some of the vehicle types identified in the left-hand column of the table would change if the table was prepared on the basis of a single selected charging option. However, the general order of the impacts shown would not change, indicating a similar range of impacts in each State, although possibly applying to different vehicle types.

As generalisations the following observations apply:

- The greatest impacts tend to occur in the Northern Territory where current charges are lowest, the smallest impacts in New South Wales where current charges are highest.

TABLE A PERCENTAGE CHANGE IN VEHICLE OPERATING COSTS — AUSTRALIA[a]
(per cent)

Route and vehicles	OAG Phase 1		OAG Phase 2	Weighted average of State charges		NSW charges	
	Flat charge	Distance based		Flat charge	Distance based	Flat charge	Distance based
New South Wales							
3-axle 12-tonne flat top rigid	–1.4	–1.0	na	–0.5	1.9	0.0	3.1
Flat top double road train	0.4	0.7	6.6	na	na	0.0	0.2
Queensland							
Refrigerated double road train	0.9	1.8	7.1	na	na	0.6	1.4
Refrigerated B-double	3.4	5.8	7.0	1.5	3.0	3.6	6.1
South Australia							
6-axle refrigerated semitrailer	2.0	3.7	4.2	0.7	1.8	1.6	3.2
Flat top B-double	3.1	5.7	6.9	1.4	3.0	3.3	6.0
Tasmania							
6-axle semitrailer tanker	3.6	2.3	2.7	1.8	1.0	3.1	1.9
3-axle rigid tipper/2-axle pig	8.6	14.3	4.3	1.1	2.5	3.1	5.7
Western Australia							
Refrigerated double road train	0.9	3.7	6.2	na	na	0.7	3.3
Flat top double road train	1.5	4.0	10.0	na	na	1.1	3.5
Northern Territory							
Triple road train (refrigerated)	2.0	4.5	9.0	0.6	1.5	na	na
Double road train (pantechnicon)	3.4	5.6	14.3	na	na	2.9	5.0

na Not applicable

a. Ranked in terms of average impact.

- Distance based charging scenarios produce a greater impact than fixed rate charging scenarios in all States except Tasmania, where the converse usually applies. This result reflects the finding that mainland rural and remote area road users tend to travel above-average annual distances for their respective vehicle classes, while Tasmanian remote area road users tend to travel below-average annual distances for their respective vehicle classes.
- Very broadly, the impact of OAG schemes Phase 1 and Phase 2 would be to vary vehicle operating costs nationally between about –1 and +10 per cent, with some instances of up to about +14 per cent in the Northern Territory and in Tasmania. A move to uniform weighted average State charges would produce the smallest effects on operating costs, usually of the order of +1 or +2 per cent. (Some New South Wales operators would experience a decrease in costs of the order of 0.5 per cent under the flat charge option.) A move to current New South Wales charges would increase costs for other State operators by about 3 per cent, very roughly.

Impact on vehicle operating costs at the State and Territory level

Six State based tables, not reproduced in this summary, provide the basis for the following more detailed findings.

Northern Territory

- In the Northern Territory, the OAG Phase 1 flat charge would raise operating costs for typical road train operations by about 2 to 3 per cent. A distance based variant would increase this to about 4 to 6 per cent due to the above-average distances that are travelled by typical road trains.
- OAG Phase 2 charges, including the phasing in of full cost recovery, would cause an increase in operating costs of about 9 to 14 per cent.
- Application of weighted average State charges on a flat fee basis would increase costs by about 0.75 per cent, with the distance based formulation increasing this to about 1.5 to 2 per cent.
- New South Wales does not permit the operation of triple road trains, so that for many Northern Territory operations it is not possible to provide estimates based on New South Wales charges.

Queensland, Western Australia and South Australia

- In these States, a greater variety of relevant vehicle operations increases the disparity of effects.
- OAG Phase 1 flat charges would occasion cost increases of between 1 and 3.5 per cent and a fully implemented OAG Phase 2 would produce cost increases ranging from about 4 to 10 per cent.
- Weighted average State charges would increase operating costs in these States by about 0.5 to 1 per cent. A distance based formulation would increase them by about 1.5 to 3 per cent.
- New South Wales charges would normally increase operating costs by about double the effect of the corresponding weighted average charge.
- The concessions offered road train operators under the OAG Phase 1 recommendations would mean that, other factors being equal, operators of semitrailers and B-doubles would experience percentage cost increases roughly twice as large as those faced by road train operators. This is a significant distortion and anomaly.

New South Wales

- OAG Phase 1 flat charges would increase operating costs by less than 0.5 per cent and, in the case of some 2- and 3-axle trucks, would decrease operating costs by up to 1.5 per cent.
- OAG Phase 2 charges would increase costs by 5 or 6 per cent in some cases while still decreasing costs for the smaller heavy trucks.
- Weighted-average State charges would decrease costs unless the charges were to be distance based. In that case, the higher than average distances travelled by typical New South Wales rural and remote area operators would produce increases in costs of up to about 2 per cent.

Tasmania

- OAG Phase 1 flat charges would be associated with relatively large increases in operating costs (as compared to other States) of about 4 to 9 per cent.
- OAG Phase 2, which is a distance based scheme, would produce smaller increases of about 3 to 6 per cent.
- In broad terms, weighted average State charges would increase heavy vehicle operating costs by about 1 to 3 per cent, across both flat and distance based variants. New South Wales charges would have about double the percentage impact of the corresponding average State charge.

Impact on Queensland broadacre farms

Table B provides an indication of the impact of the selected charging scenarios on the annual operating costs of heavy vehicles used by Queensland broadacre farmers.

TABLE B PERCENTAGE CHANGE IN VEHICLE OPERATING COSTS — QUEENSLAND BROADACRE FARMS

(per cent)

	OAG Phase 1			*Weighted average of State charges*		*NSW charges*	
Route and vehicles	*Flat fee*	*Distance based*	*OAG Phase 2*	*Flat fee*	*Distance based*	*Flat fee*	*Distance based*
Pastoral zone							
Rigid (2-axle)	9.5	3.5	–7.3	25.8	6.6	37.2	11.4
Rigid (3-axle)	6.2	1.8	na	24.5	1.1	36.9	4.4
Semitrailer (5-axle)	119.8	4.2	na	36.0	–6.8	62.9	–4.3
Semitrailer (6-axle)	76.6	–0.5	0.3	40.0	–6.6	65.8	–4.1
Wheat–sheep zone							
Rigid (2-axle)	15.6	1.2	–12.1	42.6	–3.5	61.6	–0.5
Rigid (3-axle)	21.4	–1.3	na	32.4	–4.4	48.7	–2.4
Semitrailer (5-axle)	104.2	6.3	na	31.3	–4.9	54.7	–2.2
Semitrailer (6-axle)	67.0	1.3	2.3	34.9	–4.7	57.5	–2.0
High rainfall zone							
Rigid (2-axle)	8.2	3.9	–6.4	22.5	8.6	32.4	13.8
Rigid (3-axle)	12.6	3.9	na	19.0	5.0	28.6	9.1
Semitrailer (5-axle)	98.9	7.1	na	29.7	–4.3	51.9	–1.4
Semitrailer (6-axle)	63.7	2.0	2.9	33.2	–4.0	54.7	–1.3
All zones							
Rigid (2-axle)	11.8	2.6	–9.2	32.2	2.8	46.5	6.9
Rigid (3-axle)	17.5	1.0	na	26.6	–0.3	40.0	2.6
Semitrailer (4-axle)	78.5	1.8	na	27.9	–11.7	49.8	–4.9
Semitrailer (5-axle)	104.0	6.4	na	31.3	–4.9	54.6	–2.1
Semitrailer (6-axle)	66.9	1.3	2.3	34.9	–4.6	57.4	–2.0

na Not available

The impact of OAG Phase 1 (flat) charges would be particularly severe on Queensland broadacre farmers operating articulated vehicles, with operating costs rising between about 60 and 120 per cent. This result is attributable to both the low distances travelled by such vehicles and to their low estimated operating costs. If instead the OAG Phase 1 charges were distance based, then the resulting impact would vary from about –1 to +7 per cent.

The imposition of weighted average or current New South Wales charges as flat fees would also have perverse effects, unless such farmers were eligible for some rebate.

Impact on the Northern Territory beef cattle industry

Any changes to road user charges would impact on the cost of operating cattle producers' own trucks, the costs of commercial cartage of cattle, the prices received for cattle sold on farm ('paddock sales'), prices received for other methods of sale and the cost of farm inputs transported by road. Estimates of the effects on the first three components are provided in table C. Estimates of the effects on the latter two components were not estimated because of data limitations, but could be considered to be relatively small.

Beef cattle farm cash income would decrease under all of the scenarios considered in the analysis by amounts varying from about $1700 (weighted average of State and Territory charges) to $9800 (New South Wales distance based charges). These amounts would represent about 4 to 21 per cent of farm cash income in 1990–91, but it should be noted that estimates of farm cash income are volatile due to small sample size. The results should be considered to be initial benchmarks of the impacts of changes to charges in so far as they include only the principal first-round effects and do not take account of possible induced changes in production mixes and patterns of cattle movements. Such changes should be small.

TABLE C ESTIMATED CHANGES IN FARM CASH COSTS AND RECEIPTS IN THE NORTHERN TERRITORY IN 1990–91 UNDER DIFFERENT ROAD USER CHARGES

(Average $ per broadacre farm)

Scenario	*Increase in registration costs*	*Increase in direct livestock freight costs*	*Decrease in paddock sales receipts*	*Total decrease in farm cash income*
OAG Phase 1 flat fee	1 675	1 175	223	3 073
OAG Phase 2	na	5 439	1 041	na
OAG Phase 1 distance based	3 858	2 144	409	6 411
Weighted average flat fee	1 206	400	74	1 681
Weighted average distance based	4 231	788	149	5 168
NSW flat fee	2 617	1 023	208	3 848
NSW distance based	7 657	1 780	363	9 801

na Not available

TABLE D CHANGES IN AVERAGE TRANSPORT AND HANDLING COSTS FOR GRAIN
($ per tonne)

Scenario	*New South Wales*	*Victoria*	*Queensland*	*South Australia*
OAG Phase 1 flat fee	0.19	0.77	1.04	0.74
OAG Phase 2	0.72	0.21	1.13	0.73
OAG Phase 1 distance based	0.50	–0.86	0.32	0.24
NSW flat fee	0.78	1.31	2.11	1.53
NSW distance based	–0.15	0.63	0.48	0.41
Weighted average flat fee	0.44	0.72	1.41	1.03
Weighted average distance based	–0.28	0.47	0.19	0.02
Base average cost[a]	50.90	49.59	56.55	41.29

a. Estimated average cost per tonne of grain of land transport, handling and shipping to export destinations, base scenario 1990–91.

Impact on grain transport costs in eastern Australia

A partial equilibrium linear programming model was employed to produce estimates of the variation in grain transport costs under the seven hypothetical road user charging options. Table D summarises the changes in the average transport and handling costs for grain.

The different scenarios have different impacts on grain transport costs in different regions so that in some regions there may be much larger or smaller changes in costs than are suggested by consideration of State averages. For example, in Victoria under weighted average (flat rate) charges, the average impact would be an increase in costs of $0.72 per tonne; however, the upper decile impact would be an increase of $3.96 per tonne. By contrast, in Queensland under the same charges, the average impact would be almost double that of Victoria at $1.41 per tonne, but the upper decile impact would be substantially less than that of Victoria at $2.35 per tonne.

The smallest impacts on grain transport and handling costs, and hence on farm cash incomes, tend to occur under the distance based variants of weighted average, New South Wales and OAG Phase 1 charges. Under these scenarios, average transport costs would usually rise by less than $0.50 per tonne, which would normally represent an impact on average farm cash incomes of less than about 1 per cent. The largest impacts on grain transport and handling costs, and hence on farm cash income, tend to occur under New South Wales flat rate charges. In this case, average transport costs would rise by up to $2.11 per tonne, representing a decrease in farm cash incomes of up to about 3.5 per cent. As these generalisations are based on averages, they do not apply to all regions within a State, nor to all farms within a region.

NRTC heavy vehicle charges determination

The study methodology, its attendant spreadsheets and the grains model can beapplied to any specific charging option. Set out below are the average impacts that would be associated with the implementation of the June 1992 NRTC Heavy Vehicle Charges Determination:

Impact on rural and remote area heavy vehicle operating costs

- For full time commercial operators of heavy vehicles in rural and remote areas, the NRTC charges would:
  - decrease vehicle operating costs in New South Wales by up to 1.3 per cent
  - increase vehicle operating costs in all other States: by between 0.3 and 0.6 per cent in Queensland, 0.2 and 0.7 per cent in South Australia, 0.7 and 1.1 per cent in Western Australia, 1.4 and 2.5 per cent in Tasmania and between 1.4 and 2.9 per cent in the Northern Territory.

Impact on Queensland broadacre farms

- At the all zones level, the NRTC charges would increase farm vehicle operating costs by about 6 and 7 per cent for 2- and 3-axle rigid trucks and by about 30 and 35 per cent for 6- and 5-axle semitrailers, respectively. NRTC charges would increase costs for 4-axle semitrailers by about 9 per cent.
- At the all zones level, broadacre industry costs would have been increased by about $5.4 million with the implementation of the NRTC charges. The increase in costs at the all zones level would have represented a decrease of about 1.1 per cent in average farm cash incomes in 1990–91.

Impact on the Northern Territory beef cattle industry

- NRTC charges, if applied to 1990–91 circumstances, would have reduced Northern Territory beef cattle average farm cash incomes by about $2473 or 5 per cent.

Impact on grain transport costs in eastern Australia

- The NRTC charges are estimated to increase grains industry average farm cash incomes in New South Wales by between 0.3 and 0.6 per cent. In the other States average incomes would be reduced: by about 0.1 per cent in South Australia, 0.4 to 0.5 per cent in Queensland and 0.5 to 0.8 per cent in Victoria.

Additional details on the impact of the June 1992 NRTC recommended charges are set out in appendix IV.

Concluding remarks

The disparities between the relative effects of alternative charging systems, and within any individual charging system, prevent any simple statement of the potential impacts of national road transport reforms on rural and remote Australia.

The joint BTCE/ABARE study suggests, however, that the implications of almost any altered scheme are likely to be appreciable to at least some discrete categories of rural and remote area vehicle users.

CHAPTER 1 INTRODUCTION

INTRODUCTION

Under the current system of road user charges in Australia, each State and Territory independently sets charges for vehicles. These charges generally consist of a registration fee plus various fuel taxes. In addition, the Commonwealth Government imposes fuel taxes, part of which can be viewed as a type of road user charge. This system introduces distortions into the economy because charges are not necessarily related to the extent of road use and because there is incentive to base operations in those States or Territories with lower registration costs.

The Interstate Commission

In May 1990 the Commonwealth Government released the report of the Inter-State Commission entitled *Road Use Charges and Vehicle Registration: A National Scheme*. The report recommended that there should be a single national scheme of vehicle registration and road user charges in Australia to replace the current nine schemes. In addition to this the report made other recommendations in relation to the funding of roads.

The Commission found that efficient road transport in Australia required reform in three major areas:

- vehicle registration and regulation, particularly to eliminate economically inefficient variations between jurisdictions;
- road user charging, to fully recover the identifiable costs of road provision, maintenance and use with cost attribution correctly apportioned between the different classes of vehicles; and
- road funding, management and planning by the authorities at national, State, Territory and local levels, consistent with demand for roads and their usage.

Ensuing public debate on the recommendations of the Inter-State Commission, especially those relating to increased charges for heavier trucks travelling longer distances, led to a conference held in Alice Springs on 24–26 March 1991 entitled 'Transport in Rural and Remote Australia'. One of the recommendations arising from this conference was that more research should be done on the impact of

changes in road user charges on people and industries in rural and remote Australia.

Overarching Group

The recommendations and work of the Inter-State Commission were examined by a number of specialised committees of Commonwealth, State and Territory officials, all reporting to a single Overarching Group Committee (OAG). The recommendations of the OAG were subsequently put to a Special Premiers' Conference at the end of July 1991.

Special Premiers' Conference

At the Special Premiers' Conference in July 1991, heads of government agreed to a wide ranging program of reforms across the economy including specific road provision, charging and regulation reforms. In noting but not endorsing the OAG recommendations, the Conference recommended the establishment of a National Road Transport Commission (NRTC) to make recommendations on appropriate charges for road users. The Northern Territory was not a signatory to the Agreement but indicated that it would cooperate with the Commission, and may become a party depending on the outcome of the Commission's deliberations.

The Special Premiers' Conference (excluding the Northern Territory) favoured a two zone charging system based on differing costs of road provision and also agreed that charges should be phased in so as to achieve full cost recovery by not later than 1 July 1995 for all vehicles except road trains. The Conference (excluding the Northern Territory) agreed that at least fifty per cent of full cost recovery for road trains should be achieved by 1 July 1995 with full cost recovery to be reached by 1 July 2000.

National Road Transport Commission

At the July 1991 Special Premiers' Conference, heads of government agreed to establish the NRTC, to develop and implement national arrangements for registration, regulation and charging of vehicles over 4.5 tonnes.

The NRTC is required to recommend charges that:

- achieve full cost recovery;
- achieve a reasonable balance between administrative simplicity, efficiency and equity;
- improve the link between pricing and investment decisions; and
- minimise the incentive to 'shop around' for lower charges.

The Special Premiers' Conference agreed that the NRTC was to take account of:

- the impact of the proposed charges on the road transport industry and industry generally;

- the impact of the proposed charges on particular regions, such as some in remote Australia; and
- the different levels of charges that currently exist in each jurisdiction.

BACKGROUND

The Bureau of Transport and Communications Economics (BTCE) first examined the issue of road user charges in a brief paper prepared for the conference at Alice Springs. Following that conference the Government directed the BTCE, together with the Australian Bureau of Agricultural and Resource Economics (ABARE), to analyse the impact of any new charges on the cost of transport in rural and remote Australia, and the resultant impact on the consumers and producers in these areas. Work on this broader study began around August 1991.

As it was impractical to cost the impact of revised charges on all kinds of vehicle operations across all of rural and remote Australia, it was decided that work should focus on specific vehicle operations that were as representative as possible and would also address those types of remote area operations likely to be most affected by the revised charges under consideration.

The study tends to emphasise remoteness rather than rural circumstances as a result of the decision to target the consequences of altered road user charges in areas likely to be most adversely affected.

With the establishment of the NRTC, an additional focus was added to the BTCE's work and efforts were made to relate the study to the NRTC's broader objectives and time frame.

The principal object of the study has been to address the impact of a range of hypothetical charging options in such a way as to assist the processes of determining appropriate reforms to road user charges.

OUTLINE OF THE REPORT

Chapter 2 provides a description of the methodology used in the study. Chapters 3 to 6 present the results of analysis of the impact of altered road user charges on:

- vehicle operating costs in rural and remote Australia;
- Queensland broadacre farms;
- the beef cattle industry in the Northern Territory;
- grain transport costs in eastern Australia.

Chapter 7 provides a broad perspective to the findings of the study. There are three appendices. Appendix I outlines the road user charging scenarios employed for the purposes of the study. Appendix II provides a description of the Austway road transport costing system used in the study, and Appendix III records comments made by various operators of heavy vehicles across rural and remote

Australia who readily assisted in the provision of detailed information for the study. Appendix IV extends the study's calculations to apply expressly to the June 1992 NRTC *Determination on Heavy Vehicle Charges.*

CHAPTER 2 METHODOLOGY

This chapter presents a description of the methodology employed in the study. The purpose of the chapter is to provide a general overview of the way in which the study was conducted. The chapter also discusses some of the reasons guiding the selection of the adopted methodology.

The study comprised work primarily undertaken by the BTCE, which is reported in chapters 3 and 4, and work primarily undertaken by ABARE, which is reported in chapters 5 and 6. In both cases the approach taken and the areas covered were influenced by limits on the availability of relevant data and the relatively short time frame available in which to conceive and undertake the study and to publish the results. The overriding goal of the project was to contribute to the process of developing an improved system of national road user charges.

In consideration of these factors, the BTCE work focused primarily on identifying the impact of changes in road user charges on vehicle operating costs in representative rural and remote areas. In addition, the existence of data on the specific vehicle operations of Queensland broadacre farmers enabled the BTCE analysis to go further and examine the impact on this particular industry of the likely first-round effects of altered charges on farm cash income.

The existence of information previously gathered by the ABARE Australian Agricultural and Grazing Industry Survey (AAGIS), and the prior work undertaken by ABARE in developing a model of grain distribution in eastern Australia, led to decisions to focus additional work on this source material. The result was that useful estimates could be produced on the impacts of changes to charges on two important and contrasting industries: beef cattle in the Northern Territory and the transport of grain in eastern Australia. The ABARE studies each used updated vehicle operating cost estimates provided by the BTCE.

Additional work to further identify the impacts on residents, industries and communities would be a task of very considerable magnitude. Data requirements are substantial and the requisite socio-economic analysis is complex. The BTCE is not aware of any other study attempted to date which has produced satisfactory estimates of net regional effects.

BTCE METHODOLOGY

Although consideration was given to the use of nationally available statistics such as regional freight flow data, vehicle registration records and the information contained in the Australian Bureau of Statistics' *Survey of Motor Vehicle Usage* (SMVU), it was concluded that these series could not provide the required detail to enable impacts to be investigated at a localised level.

In consequence it was judged necessary to employ a case study approach. Although it was obviously impractical to cover the operation of every vehicle configuration in every rural and remote area across Australia, an attempt was made to select cases that were as representative as practical of the diverse range of vehicle operations in rural and remote areas. In addition a particular effort was made to include those aspects of rural and remote area vehicle operation that might be regarded as being potentially adversely affected by the types of revised charges under consideration.

Effects on vehicle operating costs

To give a focus to this work, the study sought to identify specific routes across rural and remote Australia along which key categories of road transport were undertaken.

These routes were selected so as to reflect the diversity of circumstances across rural and remote Australia. The criteria used to select the routes included the nature and the volume of economic activity in the centres and regions along the route, the population of centres and regions along the route, the climate and topography of the regions, the length and surfaces of the route, and the State or Territory through which the route passed.

The process of route selection was undertaken by the BTCE in consultation with officers from each of the various State and Territory transport departments. Several road transport industry associations were also advised early in the life of the project of the proposed selections.

Ten routes were finally selected, with at least one route being selected for each State and Territory, except Victoria and the Australian Capital Territory. Unfortunately time constraints ultimately prevented the extension of the study to include a Victorian route. The Australian Capital Territory was not considered to offer any high priority examples of rural and remote area vehicle use. The routes which were selected are illustrated and described in more detail in chapter 3.

Once the routes were selected, a list of operators using the selected routes was assembled. State and Territory departments responsible for the portfolios of transport and roads were contacted and provided significant assistance. Most major road transport industry associations were also contacted in an endeavour to obtain the names of members willing to participate in the survey. In some cases, telephone directories were used to supplement the first two sources to

ensure the list of operators identified against each route was sufficiently comprehensive.

The operators identified by these methods were then surveyed by telephone. The level of cooperation of the vehicle operators approached was exceptionally high with only one instance of a non-response (from Queensland). In addition to providing details sought, the drivers often made comments about remote area charging issues. These comments have been summarised and are presented (unexpurgated) in appendix III.

Particular attention was paid to the formulation of survey questions to ensure that the information sought was sufficient to meet the data needs, and that the questions were not unduly obtrusive and could be answered with only minimal reference to accounting records. The questions primarily sought information on the physical characteristics of the task performed (for example, vehicle type and age, driving details, kilometres travelled) rather than accounting details.

Two specific checks were made to ensure that the vehicle operations covered were sufficiently representative. Firstly, a check was made on whether or not the transportation of the known principal goods along the route had been accounted for (for example grain on the Eyre Peninsula). Secondly, a comparison was made of the range of vehicle types addressed in the survey with the range of vehicle types that were known to use the route in question. This information was available from Culway and AADT data supplied by the relevant State and Territory departments, or from survey data supplied by the same departments.

The survey questions were designed with the requirements of the Austway Road Transport Costing System (which is described in more detail in appendix II) in mind. Austway is a commercially available truck costing model designed to estimate the costs of particular road transport operations. The use of this model ensures that the study is based on independent estimates of vehicle costs obtained from a system that has withstood the scrutiny of the market over several years.

An important input to the Austway model was data on road and terrain conditions on each route. This was based on information from a variety of sources, including BTCE data holdings, State and Territory departments responsible for roads, and the operators themselves.

Default settings within the model enabled the use of industry standards and averages for such things as repair and maintenance expenditure, tyres, insurance and so on. This assists the general applicability of the estimates derived. The defaults were overridden, where warranted, for example by the use of relevant (remote area) fuel prices.

In the course of the survey it was noted that many operators did not travel from origin to destination solely over the selected route. Many operators start their journey from a point not on the route, and similarly finish their journey at a point off the chosen route. These operators are included in the survey results because

they make use of the route in the course of the journey and because such operators are often representative of operations on the route.

As a general observation it should be noted that the purpose of preparing estimates based on these routes was not to simulate the costs of individual operators undertaking specifically selected operations. Rather the objective was to focus the study on a relevant cross-section of important rural and remote operations and to produce indicative estimates of the costs of representative vehicle operations actually undertaken in those areas. Such activities could range from, for example, the transport of live feral goats across Queensland, to the transport of mining products in western Tasmania.

The resulting operational data were fed into the Austway model to generate operating cost estimates for each identified category of vehicle operation over a range of annual distances travelled. Using least squares regression techniques, a linear equation for the annual operating cost of each class of vehicle operation as a function of annual distance travelled was then generated.

A large spreadsheet was used to calculate the annual operating cost for each operator over a relevant range of annual distances travelled and under a range of hypothetical road user charges. On advice from the NRTC seven hypothetical road user charges were analysed. These were:

- OAG Phase 1 recommendations, on a flat rate basis;
- OAG Phase 1 recommendations on a distance travelled basis;
- OAG Phase 2 recommendations (essentially distance based);
- weighted average of existing State charges on a flat rate basis;
- weighted average of existing State charges on a distance travelled basis;
- New South Wales charges on a flat rate basis; and
- New South Wales charges on a distance travelled basis.

Charges levied on a 'flat rate' basis are similar in effect to current registration charges. They apply equally to all road users irrespective of how far, or how little, they travel. Charges levied on a 'distance travelled' basis vary directly with distance. In essence, road users travelling twice as far as others would pay twice as much. Distance based charges are notional to the extent that it would be impractical at present to levy such charges strictly in accordance with annual distance travelled. The distance travelled variants of the OAG, weighted State average and NSW charges were calculated so as to raise the same total revenue per vehicle class as the flat rate charges. Additional information on these charging scenarios is set out in appendix 1.

Essentially the seven options above can be regarded as providing upper bound (OAG), lower bound (weighted average) and intermediate (NSW) estimates of the level of revised charges that might ultimately be recommended in the interests of road transport reform.

The spreadsheet provides not only details on the effects of the charging options under various examples of annual distances travelled, but also, for the many vehicles specified, has the potential to calculate quickly the impact of any alternative hypothetical charge that might be considered.

Effects on Queensland broadacre farms

A second aspect of the BTCE work addressed the impact of changes to road user charges on Queensland farm heavy vehicles. In 1990 the Queensland Department of Transport commissioned ABARE to undertake a one-off survey of Queensland farm vehicle ownership and operation, in conjunction with ABARE's national annual survey of broadacre farms. The provision of the resulting survey data by the Queensland Department of Transport to the BTCE for the purposes of this study is gratefully acknowledged.

The survey results were analysed at the State level and by three geographic zones defined by the principle land use: pastoral zone, wheat–sheep zone, and high rainfall zone. For the State and for each zone, approximate estimates of the operating costs of representative vehicles were derived from the Austway model. For each zone, the impact of all seven hypothetical road user charges on vehicle operating costs was analysed using the spreadsheet previously described. These data were combined with data on farm cash income for the relevant properties to analyse the impact of any revised charges on the primary producer.

ABARE METHODOLOGY

Northern Territory beef cattle industry

Due to the absence of a rail network, the beef cattle industry in the Northern Territory is heavily reliant on road transport: often double or triple road trains. The long distances involved and the size of the vehicles in use mean that some mass–distance based road user charges have the potential to impact heavily on this industry.

The first-round effects of introducing any new road charging regime would be to influence the costs of operating cattle producers' own trucks, the cost of commercial cartage of cattle, the prices received for cattle sold on farm ('paddock sales'), prices received for other methods of sale and the cost of farm inputs transported by road. Analysis focused on examining the impact on farm cash income for producers in the Northern Territory under existing charges and under the hypothetical road charging options. Some twenty-nine beef producers participated in a special supplementary telephone survey conducted by ABARE to obtain the necessary supplementary information required for this study.

In the analysis, ABARE focused their work on estimating the first-round effects: that is, the effects on the cost of registering the farmer's own trucks, the cost of commercial cartage of cattle and the prices received on paddock sales of cattle. Because of data limitations, ABARE did not calculate the effects on input costs.

Grain transport costs

A previously developed linear programming model of the movement of grain in eastern Australia from farm to ship was used for this study (Blyth, Noble & Mayers 1987). This model, which identifies the routes and transport modes that minimise the total costs of transporting grain under any given charging regime, lends itself well to an analysis of the impact of changes to road user charges.

The eastern Australian grain industry contrasts markedly with the Northern Territory beef cattle industry. Comprehensive rail networks across much of eastern Australia provide an important alternative to road transport, distances travelled by road are usually much shorter, and the vehicles employed are small by comparison with road trains. The area of operations could be regarded as more rural than remote. Transport of grains throughout Victoria is covered in this work, along with New South Wales and parts of South Australia and Queensland.

The ABARE model was originally specified for both road and rail using 1984 data. Consequently the first step was to update costs employed in the model. For road, two representative vehicles (a rigid 3-axle farm truck and an articulated 6-axle contractor truck) are specified in the model. Using the Austway model the BTCE provided updated formulae for operating costs as a function of distance under each of the seven hypothetical charging systems. Australian National for South Australia, the Public Transport Commission for Victoria, State Rail for New South Wales, and Queensland Rail provided extensive tabular data through the BTCE, with which to update the rail coefficients in the model.

CONCLUDING REMARKS

This chapter has sought to provide a general understanding of the methodology adopted across the study as a whole. Each of the four succeeding chapters rely, to some extent, on aspects of the general description provided here. The chapters also elaborate, as appropriate, on the details applicable to that particular chapter. This is especially the case in chapter 3, in which additional information is provided on the routes selected for study, along with further details of the telephone survey questions.

In drafting this report, an effort has been made to present the results of each of the four principal component parts of the study in an essentially self-contained manner, while minimising repetitive comment on shared aspects of methodology.

CHAPTER 3 IMPACT OF CHANGES TO ROAD USER CHARGES ON VEHICLE OPERATING COSTS

INTRODUCTION

This chapter addresses the effects that changes to road user charges might be expected to have on representative full-time commercial vehicle operators across rural and remote Australia. The diversity and complexity of these effects require that this chapter have two distinct parts. The first part elaborates briefly on the methodology employed in the study and provides a broad overview of the principal outcomes of the study and a general appreciation of the results obtained. The second part presents data and results in greater detail. It is intended to enable individual operators of remote area heavy vehicles to relate their own particular

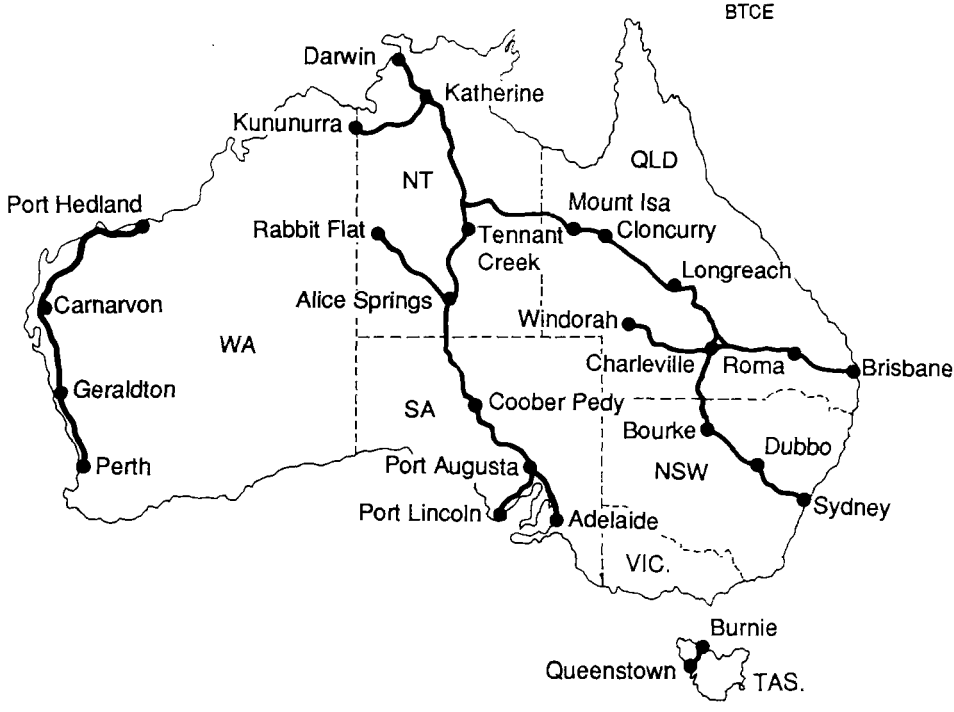


Figure 3.1 Routes examined in the remote area study

circumstances to the material presented and so infer estimates of potential impacts applicable to their situation.

PART 1 — GENERAL RESULTS

Methodology

A general description of the methodology adopted for the purposes of this study is provided in chapter 2. The additional details presented here assume familiarity with that chapter.

The routes selected for the study are illustrated in figure 3.1. These routes were chosen to provide a suitable national focus on representative rural and remote area heavy vehicle operations. The tables presented in part 2 of this chapter set out details of the relevant traffic sources, vehicles, trailers and freight carried on each of these routes. Data provided by vehicle operators utilising these routes were the basis for all the estimates reported in this chapter.

About sixty individual operators were contacted and asked to participate in the survey. Only one small Queensland company declined. The questions put to operators are listed in table 3.1. For the most part the survey was conducted by telephone, enabling ready clarification of both questions and answers. The information sought related primarily to the physical task undertaken by the operators and was designed to enable the estimation of representative operating costs. It was not the object of the survey to estimate the specific operating costs of those contacted.

The data obtained from the telephone survey on representative rural and remote area heavy vehicle operations were used in conjunction with the Austway Road

TABLE 3.1 QUESTIONS INCLUDED IN THE BTCE SURVEY OF HEAVY VEHICLE OPERATORS

1	What operations do you run (for example, general freight, stock)? Where do you operate (for example, Dubbo to Mount Isa)?
For each type of operation and vehicle:	
2	What type of vehicle is used (for example, 6-axle semitrailer, pantechnicon)?
3	How much freight is carried each way, on average (for example, tonnes, litres)?
4	What is the return driving time (hours)? What are loading and unloading times? How many trips per week? Which days per week?
5	How many kilometres annually?
6	How old is the vehicle (prime mover and trailers)?
7	Is the vehicle leased, hire purchased or owned?
8	Are retreads used?
9	What are typical fuel prices?

Transport Costing System (see appendix II) to develop estimates of indicative annual vehicle operating costs.

As described in chapter 2, with elaboration in appendix I, the study examined the potential impacts of seven hypothetical charging options. These were:

OAG Phase 1 (flat fee)
OAG Phase 1 (distance based)
OAG Phase 2 (essentially distance based)
Weighted average of State charges (flat fee)
Weighted average of State charges (distance based)
New South Wales charges (flat fee)
New South Wales charges (distance based)

These charges were considered to represent upper bound (OAG), lower bound (weighted average) and intermediate estimates (New South Wales) of the level of revised charges that might emerge from the processes of road transport reform. The charges were examined in both flat fee and distance based variants, the latter calculated to raise the same total revenue per vehicle class as the corresponding flat fee alternative. Flat and distance based fees have different advantages and disadvantages not addressed in this study. What has been addressed is the differing impacts that such fee structures have.

Diversity of effects

The effect on any given heavy vehicle operator of a change in road user charges depends on:

- the current applicable charges;
- the level of future charges;
- the charging principles applied (fixed or distance related charges, the availability of rebates against flat fees, etc.);
- the nature of vehicle operations (distance travelled, operating costs); and
- competitive circumstances (existence of a rail alternative, nature of the market, overall level of economic activity, etc.).

Given the diversity of factors determining specific vehicle operating costs and the diversity of factors that influence changes upon those costs, it is not surprising that altered charges are likely to impact upon different vehicle operators in different ways. The discussion presented in this part seeks to provide a general understanding of such impacts by presenting illustrative examples drawn from the more detailed results embodied in the tables provided in part 2 of this chapter.

Variation in current State and Territory charges

This study investigates the replacement of current registration charges, presently levied as flat fees irrespective of annual distance travelled, with alternative road user charges, either flat fee or distance based. The study did not investigate changes to Commonwealth or State fuel taxes.

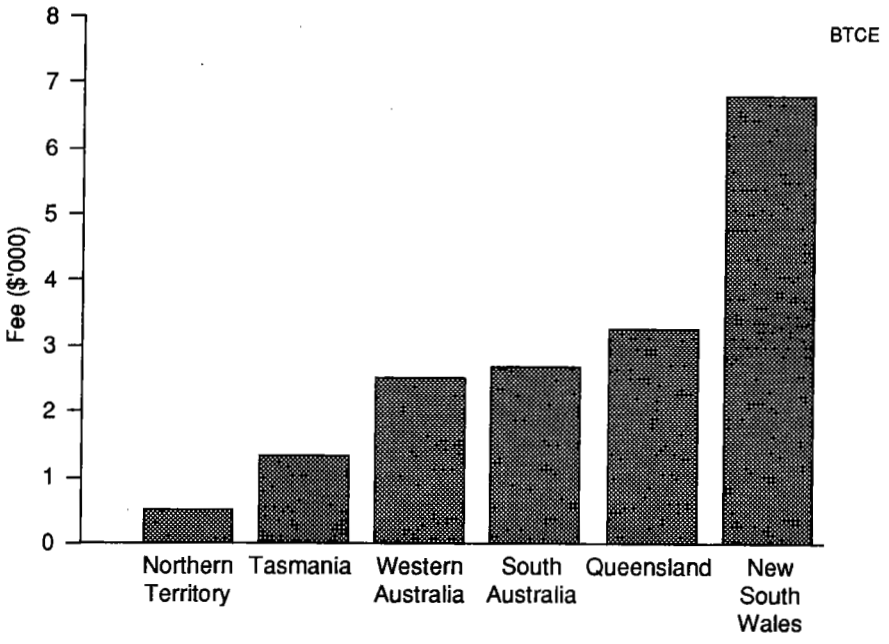


Figure 3.2 January 1991 registration charges for a 6-axle semitrailer

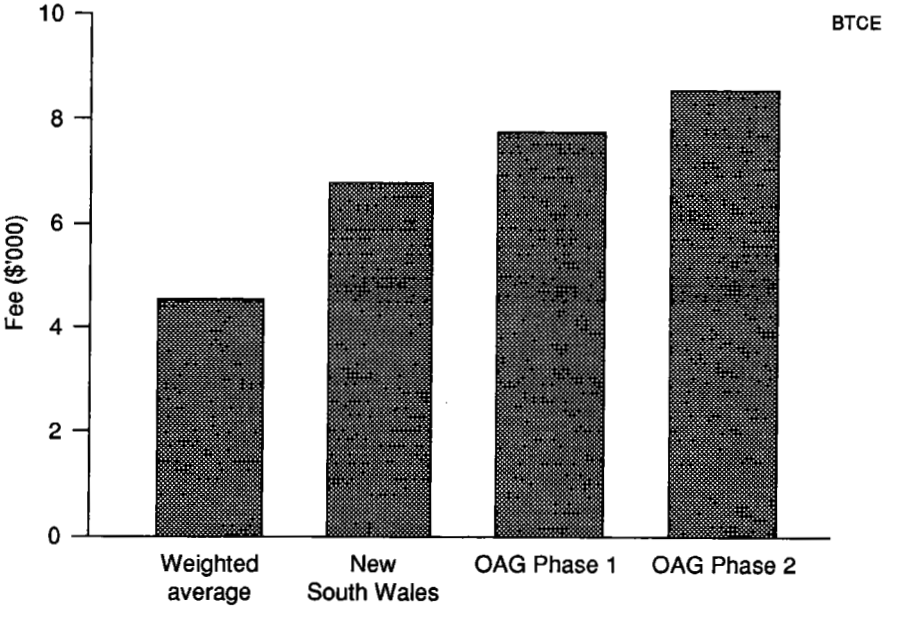


Figure 3.3 Possible future registration charges for a 6-axle semitrailer

Current registration charges can vary by up to several hundred per cent between the States and Territories. As an illustration, figure 3.2 shows the January 1991 registration charges applicable to a typical 6-axle semitrailer. Table I.4 in appendix I sets out the current registration charges by vehicle category, as adopted for the purposes of this study. Note that because the States and Territories adopt different charging bases (for example, gross mass, tare mass, engine size, number of axles, etc.) the charges shown in such comparisons are indicative rather than exact.

Hypothetical future charges

The debate to date on possible future road user charges has canvassed charging options that also vary substantially. For the purposes of this study that range was reduced somewhat by the selection of the chosen hypothetical charging options. A limited illustration of the range of possible future charges considered is provided by figure 3.3. These charges would apply to a typical 6-axle semitrailer travelling average annual distances under both flat fee and distance based schemes. Tables I.1 and I.2 in appendix I set out the detailed charges for the various vehicle classes under each of the hypothetical charging options adopted for this study. As explained in appendix I, the charging formulae for the distance based fees, including OAG Phase 2, are notional to the extent that it would be impractical at present to levy such charges strictly in accordance with distance travelled.

An example of changes in operating costs

Table 3.2 sets out the changes in operating costs for a 6-axle semitrailer that would result from two flat charging options and two distance based charging options. The distances used were the averages of those reported by the operators in each State. The table depicts the results in both absolute terms (the dollar increase in annual charges payable) and in relative terms (the percentage increase in annual operating costs). The latter figure helps place increased charges in perspective and provides some indication of the potential for consequential increases in freight charges. The table provides examples of many

TABLE 3.2 CHANGE IN OPERATING COST FOR A 6-AXLE SEMITRAILER

	Weighted average flat fee		*NSW distance based*		*OAG Phase 1 flat fee*		*OAG Phase 2*	
	$	*%*	*$*	*%*	*$*	*%*	*$*	*%*
South Australia, Western Australia, Queensland	1 837	1.0	6 712	3.6	5 066	2.7	9 063	4.8
New South Wales	–2 273	–1.0	4 048	1.8	956	0.4	6 722	2.9
Tasmania	3 196	3.0	4 457	4.1	6 425	6.0	6 000	5.6

of the generalisations to emerge from the study, but it is important to note that these generalisations do not hold for all vehicles or for all circumstances of use. The figures show that on average:

- under all charging options, New South Wales operators would experience the smallest percentage increases in costs (including a decrease in costs under one option), primarily reflecting the higher charges they currently pay;
- South Australian, Western Australian and Queensland operators would experience roughly similar, and an intermediate level of cost increases, primarily reflecting their broadly similar current levels of charges;
- Tasmanian operators would experience the greatest percentage increase in charges under all charging options, primarily reflecting their current low level of charges;
- Northern Territory operators are not shown in table 3.2, as 6-axle semitrailers are not a representative remote area freight vehicle in the Territory; however, current Northern Territory charges are even lower than Tasmanian charges (see figure 3.2);
- flat rate charges would produce smaller percentage increases in costs than distance based charges in New South Wales, South Australia, Western Australia and Queensland. The converse is true in Tasmania. This result primarily reflects the fact that Tasmanian rural and remote area operators tend to travel less than national average annual kilometres while New South Wales, South Australia, Western Australia and Queensland operators tend to travel more than national average annual kilometres; and
- a given increase in absolute charges represents a higher proportion of annual operating costs in Tasmania than in any other State.

It is always true that (even for a single vehicle type) any given charging option will produce divergent effects on operators across the States and also divergent effects on operators within a State.

An example of impacts across vehicle types

Table 3.2 presented some of the effects of different charges across States, for a single vehicle type. Figure 3.4 provides an illustration of the effects of different charges across different vehicle types, for a single State, in this case New South Wales. The figure illustrates that any given charging option will usually produce divergent relative effects across varying vehicle types (even within a State).

Effects of road train discounts

OAG Phase 1 charges incorporate a 50 per cent discount for road trains which was to be gradually phased out upon the introduction of the essentially distance based OAG Phase 2 charges. In this study, OAG Phase 2 charges are those assumed to apply after the 50 per cent discount has been withdrawn.

The BTCE survey showed that in Queensland, South Australia, Western Australia and New South Wales there were instances of semitrailers, B-doubles and road

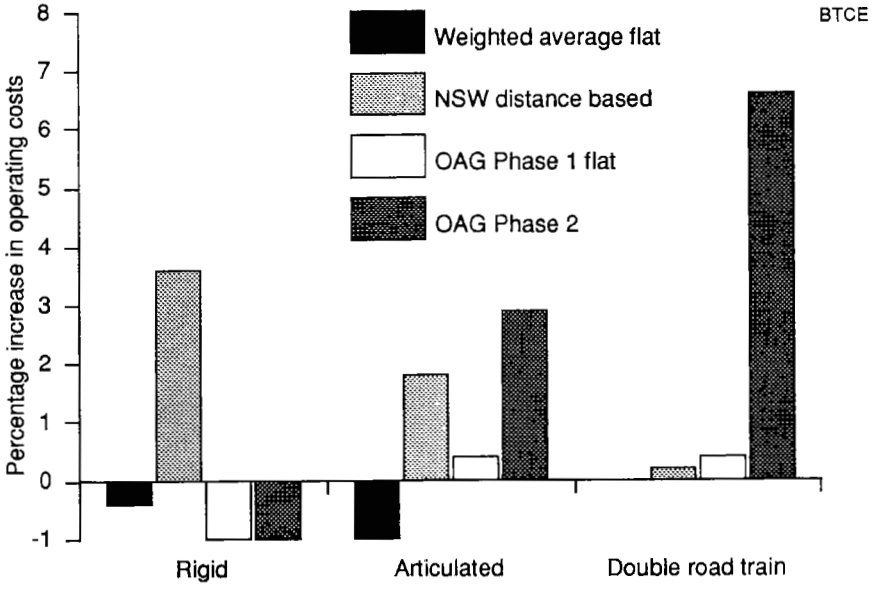


Figure 3.4 The effects of different potential road user charges for different vehicle types in New South Wales

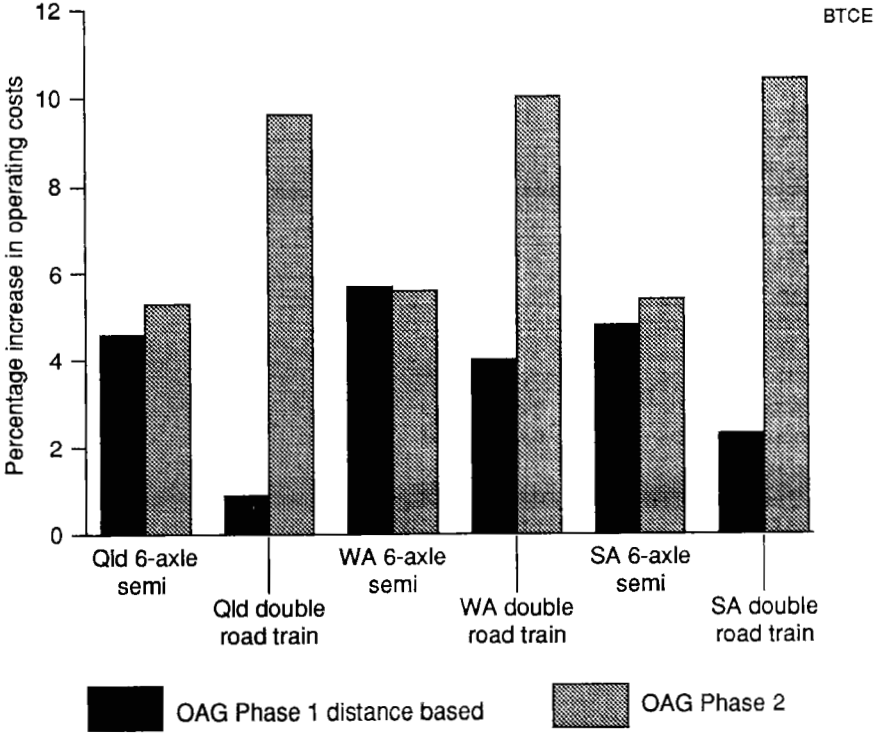


Figure 3.5 The effects of discounts on road user charges for road trains

trains operating, and sometimes competing, over similar routes. Figure 3.5 shows the impact of OAG Phase 1 (distance based) and Phase 2 charges on semitrailers and double road trains in Queensland, South Australia and Western Australia. Reflecting the 50 per cent road train concession, the proportionate impact of OAG Phase 1 distance based charges on the operating costs of road trains in these States is approximately half that imposed on the operators of semitrailers. The result is not exactly half in each case because of variations in annual distances travelled, annual operating costs and the current levels of State charges. A broadly similar result is obtained when the effects of OAG Phase 1 flat charges are compared, although in this case the distortion associated with the concession is superimposed on the variable impacts on annual operating costs that result when a constant 'average' charge is applied irrespective of the extent of road use.

The value of the 50 per cent concession to road train operators can be very large and is illustrated by the difference between the Phase 1 distance based charge

TABLE 3.3 PERCENTAGE CHANGE IN VEHICLE OPERATING COSTS — AUSTRALIA[a]
(per cent)

	OAG Phase 1			*Weighted average of State charges*		*NSW charges*	
Route and vehicles[b]	*Flat fee*	*Distance based*	*OAG Phase 2*	*Flat fee*	*Distance based*	*Flat fee*	*Distance based*
New South Wales							
3-axle 12-tonne flat top rigid	–1.4	–1.0	na	–0.5	1.9	0.0	3.1
Flat top double road train	0.4	0.7	6.6	na	na	0.0	0.2
Queensland							
Refrigerated double road train	0.9	1.8	7.1	na	na	0.6	1.4
Refrigerated B-double	3.4	5.8	7.0	1.5	3.0	3.6	6.1
South Australia							
6-axle refrigerated semitrailer	2.0	3.7	4.2	0.7	1.8	1.6	3.2
Flat top B-double	3.1	5.7	6.9	1.4	3.0	3.3	6.0
Tasmania							
6-axle semitrailer tanker	3.6	2.3	2.7	1.8	1.0	3.1	1.9
3-axle rigid tipper/2-axle pig	8.6	14.3	4.3	1.1	2.5	3.1	5.7
Western Australia							
Refrigerated double road train	0.9	3.7	6.2	na	na	0.7	3.3
Flat top double road train	1.5	4.0	10.0	na	na	1.1	3.5
Northern Territory							
Triple road train (refrigerated)	2.0	4.5	9.0	0.6	1.5	na	na
Double road train (pantechnicon)	3.4	5.6	14.3	na	na	2.9	5.0

na Not available

a. Ranked in terms of average impact.

b. Identifies the vehicle that is least affected, and the vehicle that is most affected in each State and Territory, by the average impact of the seven hypothetical charges.

and the Phase 2 non-concessionary (85th percentile) charge shown in figure 3.5. In Queensland, the concession results in the impact on operating costs being reduced from around 10 per cent to around 1 per cent. This 'multiplier' effect primarily results from the 50 per cent concession reducing OAG Phase 1 charges to near the current State charges. For semitrailer operators, with no concessions, there is little difference between OAG Phase 1 distance based charges and OAG Phase 2 charges, as would be expected.

Rangs of impacts on vehicle operating costs at the national level

Table 3.3 provides an indication of the range of impacts to be expected on full-time commercial vehicle operators in rural and remote areas, for all of the selected hypothetical charging options. The table identifies the vehicle type that is least affected, and the vehicle type that is most affected in each State and Territory, by the average impact of the seven hypothetical charges. Because a given vehicle type can be amongst the least affected by one scheme and among the most affected by another scheme, some of the vehicle types identified in the left-hand column of the table would change if the table was prepared on the basis of a single selected charging option. However, the general order of the impacts shown would not change, indicating a similar range of impacts in each State, although possibly across different vehicle types.

Very broadly, the impact of OAG schemes Phase 1 and Phase 2 would be to vary vehicle operating costs nationally between about –1 per cent and +10 per cent, with some instances of up to about +14 per cent in the Northern Territory and in Tasmania. A move to uniform weighted average State charges would produce the smallest effects on operating costs, usually of the order of +1 or +2 per cent. (Some New South Wales operators would experience a decrease in costs of the order of 0.5 per cent under the flat charge option.) A move to current New South Wales charges would increase costs for other State operators by about 3 per cent, very roughly.

PART 2 — DETAILED RESULTS

The detailed results of the BTCE study of the impact of changes to road user charges on vehicle operating costs in rural and remote Australia are contained in tables 3.4 to 3.21. Tables 3.4 to 3.9 list details of the route(s), traffic sources, vehicles, trailers and freight carried, for which estimates were produced. Tables 3.10 to 3.15 provide State and Territory summaries of the absolute changes in annual vehicle operating costs associated with each of the hypothetical charging options described in chapter 2 and appendix I. Finally, tables 3.16 to 3.21 provide State and Territory summaries of the percentage changes in annual vehicle operating costs associated with each of the selected hypothetical charging options.

Tables 3.10 to 3.21 are intended to provide data relevant to a broad cross-section of representative remote area heavy vehicle operations. It is expected that most individual operators of heavy vehicles should be able to relate their own particular

circumstances to some of the material presented and so infer a broad estimate of the effects applicable in their own case.

Impacts on vehicle operating costs at the State and Territory level

Tables 3.16 to 3.21 provide the basis for the following observations applicable to the potential impacts on a State by State basis.

Northern Territory

- In the Northern Territory, the OAG Phase 1 flat charge would raise operating costs for typical road train operations by about 2 to 3 per cent. A distance based variant would increase this to about 4 to 6 per cent due to the above average distances that are travelled by typical road trains.
- OAG Phase 2 charges, including the phasing in of full cost recovery, would cause an increase in operating costs of about 9 to 14 per cent.
- Application of weighted State average charges on a flat fee basis would increase costs by about 0.75 per cent, with the distance based formulation increasing this to about 1.5 to 2 per cent.
- New South Wales does not permit the operation of triple road trains so that for many Northern Territory operations it is not possible to provide estimates based on NSW charges.

Queensland, Western Australia and South Australia

- In these States, a greater variety of relevant vehicle operations increases the disparity of effects.
- OAG Phase 1 flat charges would occasion cost increases of between about 1 and 3.5 per cent and a fully implemented OAG Phase 2 would produce cost increases ranging from about 4 to 10 per cent.
- Weighted average State charges would increase operating costs in these States by about 0.5 to 1 per cent. A distance based formulation would increase them by about 1.5 to 3 per cent.
- New South Wales charges would normally increase operating costs by about double the effect of the corresponding weighted average charge.
- The concessions offered road train operators under the OAG Phase 1 recommendations would mean that, other factors being equal, operators of semitrailers and B-doubles would experience percentage cost increases roughly twice as large as those faced by road train operators.

New South Wales

- OAG Phase 1 flat charges would increase operating costs by less than 0.5 per cent and, in the case of some 2- and 3-axle trucks, would decrease operating costs by up to 1.5 per cent.

- OAG Phase 2 charges would increase costs by 5 or 6 per cent in some cases while still decreasing costs for the smaller heavy trucks.

- Weighted average State charges would decrease costs slightly unless the charges were to be distance based. In that case, the higher than average distances travelled by typical New South Wales rural and remote area operators would produce increases in costs of up to about 2 per cent.

Tasmania

- OAG Phase 1 flat charges would be associated with relatively large increases in operating costs (as compared to other States) of about 4 to 9 per cent.

- OAG Phase 2, which is a distance based scheme, would produce smaller increases of about 3 to 6 per cent.

- In broad terms, weighted average State charges would increase heavy vehicle operating costs by about 1 to 3 per cent, across both flat and distance based variants. New South Wales charges would have about double the percentage impact of the corresponding average State charge.

CONCLUSION

The disparities between the relative effects of alternative charging systems, and within any individual charging system, prevent any simple statement of the potential impacts of national road transport reforms on rural and remote Australia.

The joint BTCE/ABARE study suggests that the implications of almost any altered scheme are likely to be appreciable to at least some discrete categories of rural and remote area vehicle users.

As a general rule, however, the OAG charges would impose more and larger cost increases upon vehicle operators (and their customers) than the introduction of New South Wales charges than, in turn, weighted average State charges. It is possible to find counter-examples to this generalisation, so that not all vehicle operators would rank the effects in this order. Distance based schemes tend to have the greatest impacts on operators in those States and Territories where annual distances travelled are often high. Fixed rate (unrebated) schemes tend to operate against the interests of Tasmanian operators and other individuals in all States whose annual distance travelled is below average. Whenever annual distances travelled differ appreciably between road users, any flat charge scheme will comparatively disadvantage the lower distance road users, the extent of the disadvantage increasing with the size of the fixed charge. Each type of scheme has its own administrative, efficiency, enforcement, equity and other trade-offs that fall outside the scope of this study.

The results of the study did highlight the substantial inequities that would be caused by the incorporation of concessions limited to road trains under the OAG Phase 1 scheme and early stages of the OAG Phase 2 scheme. Under these schemes, the operators of semitrailers and B-doubles in Queensland, Western Australia, South Australia and New South Wales would experience percentage increases in annual operating costs roughly twice as large as those faced by the operators of road trains.

TABLE 3.4 FREIGHT TRANSPORT DETAILS ON SELECTED NORTHERN TERRITORY ROUTES

Route	*Traffic Source*	*Vehicle type*	*Trailer type*	*Freight type*
Stuart Highway: Darwin to Alice Springs	Major towns on route including Darwin, Katherine, Tennant Creek and Alice Springs Traffic from Kununurra, Adelaide and Mount Isa Livestock traffic generated off the route utilising Stuart Highway: farm to farm, farm to rail head, farm to port, farm to abattoir	Double and triple road trains	Flat top Pantechnicon Tanker Stockcrate Refrigerated	General freight Fuel Cattle Refrigerated products
Tanami Road: Alice Springs to Rabbit Flat	Mine at Rabbit Flat	Triple road trains	Tanker	Fuel

TABLE 3.5 FREIGHT TRANSPORT DETAILS ON SELECTED QUEENSLAND ROUTES

Route	*Traffic Source*	*Vehicle type*	*Trailer type*	*Freight type*
Brisbane to Mount Isa	Major towns including Longreach, Cloncurry and Mount Isa Stations and properties	6-axle semitrailers Double road trains[a]	Flat top Stockcrate Refrigerated	General freight Livestock Refrigerated products
Brisbane to Windorah	Major towns including Roma, Charleville, and Windorah Stations and properties Mining operations	6-axle semitrailers B-doubles Double road trains	Flat top Tanker Stockcrate Refrigerated Tipper	General freight Fuel Livestock Mining products Refrigerated products

a. Double road trains are permitted to operate west of Toowoomba.

TABLE 3.6 FREIGHT TRANSPORT DETAILS ON SELECTED WESTERN AUSTRALIAN ROUTES

Route	*Traffic Source*	*Vehicle type*	*Trailer type*	*Freight type*
Perth to Port Hedland	Major towns on the route including Carnarvon, Karratha and Port Hedland Major industries on route such as iron ore mines in Pilbara Other mining developments, fishing, fruit and vegetables	6-axle semitrailers Double road trains[a] Triple road trains	Flat top Pantechnicon Refrigerated Tanker Tipper	General freight Refrigerated products Fuel Mining equipment Mining products

a. Double road trains are most commonly used.

TABLE 3.7 FREIGHT TRANSPORT DETAILS ON SELECTED SOUTH AUSTRALIAN ROUTES

Route	*Traffic Source*	*Vehicle type*	*Trailer type*	*Freight type*
Adelaide to Eyre Peninsula	Adelaide to Eyre Peninsula traffic Intra-peninsula traffic including farm to rail, farm to port, rail terminal to port[a], farm to meatworks	6-axle semitrailers and other smaller semitrailers B-doubles Double road trains	Flat top Stockcrate Refrigerated Pantechnicon Tipper	General freight Livestock (including sheep and cattle) Mining products
Stuart Highway: Adelaide to Coober Pedy	Towns along route including Coober Pedy, Oodnadatta and Cadney Park Mining industries	5- and 6-axle semitrailers	Flat top	General freight Mining equipment

a. In times of excess demand for rail.

TABLE 3.8 FREIGHT TRANSPORT DETAILS ON SELECTED NEW SOUTH WALES ROUTES

Route	*Traffic Source*	*Vehicle type*	*Trailer type*	*Freight type*
Mitchell Highway: Sydney to Bourke	Major towns on or near the route such as Dubbo, Nyngan, Bourke and Cobar Freight destined for Mount Isa and Darwin from Sydney	2- and 3-axle rigid trucks between towns on route 6-axle semitrailers between Sydney and Bourke Double road trains	Flat top Stockcrate Pantechnicon Tipper	General freight Grain Livestock (for meat export) Refrigerated products (e.g. fish)

a. Double road trains are permitted to operate north of Narromine and are used for the through service to Darwin and Mount Isa. They are also used in the Bourke region for mining and livestock transport.

TABLE 3.9 FREIGHT TRANSPORT DETAILS ON SELECTED TASMANIAN ROUTES

Route	*Traffic Source*	*Vehicle type*	*Trailer type*	*Freight type*
Bass–Murchison–Zeehan Highway: Burnie to Queenstown[a]	Major towns on route including Queenstown, Rosebery and Burnie Towns just off the route including Waratah, Savage River, Zeehan and Strahan Copper mining operations near Queenstown Sand mining operations near Strahan Quarries	Rigid trucks with trailers Semitrailers[b]	Flat top Tipper Tanker	General freight Mining products Raw materials Fuel

a. Little of the traffic is origin–destination direct traffic.

b. Larger vehicles such as B-doubles and road trains are not permitted in Tasmania.

TABLE 3.10 ABSOLUTE CHANGE IN VEHICLE OPERATING COSTS — NORTHERN TERRITORY

($)

Route and vehicles	OAG Phase 1 Flat fee	OAG Phase 1 Distance based	OAG Phase 2	Weighted average of State charges Flat fee	Weighted average of State charges Distance based	NSW charges Flat fee	NSW charges Distance based
Stuart Highway							
Alice Springs to Darwin							
Triple road train refrigerated	9 812	22 216	44 962	2 793	7 564	na	na
Triple road train pantechnicon	9 812	26 897	44 962	2 793	9 365	na	na
Triple road train tanker	9 812	26 897	44 962	2 793	9 365	na	na
Triple road train flat top	9 812	28 067	44 962	2 793	9 815	na	na
Darwin to Katherine							
Double road train pantechnicon	6 431	10 795	27 372	na	na	5 607	9 629
Other routes							
Triple road train stockcrate	9 812	18 121	44 962	2 793	5 989	na	na
Tanami Road							
Triple road train tanker	9 812	12 855	33 425	2 793	3 963	na	na

na Not available

TABLE 3.11 ABSOLUTE CHANGE IN VEHICLE OPERATING COSTS — QUEENSLAND

($)

Route and vehicles	OAG Phase 1 Flat fee	OAG Phase 1 Distance based	OAG Phase 2	Weighted average of State charges Flat fee	Weighted average of State charges Distance based	NSW charges Flat fee	NSW charges Distance based
Warrego/Landsborough/Barkly Highways							
Brisbane to Mount Isa							
6-axle refrigerated semitrailer	4 490	12 150	11 140	1 261	5 878	3 534	10 473
Flat top double road train	2 382	7 213	24 453	na	na	1 558	6 011
Refrigerated double road train	2 382	4 798	18 612	na	na	1 558	3 784
Warrego Highway/Diamantina Developmental Road							
Brisbane to Windorah							
6-axle flat top semitrailer	4 490	9 357	10 698	1 261	4 195	3 534	7 943
6-axle semitrailer tipper	4 490	8 160	9 371	1 261	3 473	3 534	6 859
6-axle semitrailer stockcrate	4 490	9 756	11 140	1 261	4 435	3 534	8 304
Refrigerated B-double	8 486	14 417	17 454	3 721	7 443	8 964	15 251
Double road train stockcrate	2 382	7 135	24 265	na	na	1 558	5 939
Double road train tanker	2 382	6 356	22 380	na	na	1 558	5 221

na Not available

TABLE 3.12 ABSOLUTE CHANGE IN VEHICLE OPERATING COSTS — WESTERN AUSTRALIA

($)

Route and vehicles	OAG Phase 1 Flat fee	OAG Phase 1 Distance based	OAG Phase 2	Weighted average of State charges Flat fee	Weighted average of State charges Distance based	NSW charges Flat fee	NSW charges Distance based
North West Coastal Highway							
Perth to Port Hedland							
6-axle flat top semitrailer	5 233	12 095	11 883	2 004	6 140	4 277	10 493
6-axle semitrailer pantechnicon	5 233	8 903	10 114	2 004	4 216	4 277	7 602
Flat top double road train	3 876	10 578	26 701	na	na	3 052	9 228
Refrigerated double road train	3 876	16 032	26 701	na	na	3 052	14 256
Double road train pantechnicon	3 876	18 760	26 701	na	na	3 052	16 769
Double road train tanker	3 876	12 526	26 701	na	na	3 052	11 024
Triple road train tipper	6 894	9 298	42 044	–125	4 646	na	na
Triple road train pantechnicon	6 894	27 490	42 044	–125	7 797	na	na
Flat top triple road train	6 894	28 075	42 044	–125	8 022	na	na
Refrigerated triple road train	6 894	27 490	42 044	–125	7 797	na	na

na Not available

TABLE 3.13 ABSOLUTE CHANGE IN VEHICLE OPERATING COSTS — SOUTH AUSTRALIA

($)

Route and vehicles	OAG Phase 1 Flat fee	OAG Phase 1 Distance based	OAG Phase 2	Weighted average of State charges Flat fee	Weighted average of State charges Distance based	NSW charges Flat fee	NSW charges Distance based
Eyre Peninsula							
6-axle flat top semitrailer	5 066	7 938	9 063	1 837	3 568	4 110	6 712
6-axle semitrailer tipper	5 066	8 736	9 947	1 837	4 049	4 110	7 435
6-axle semitrailer stockcrate	5 066	13 523	11 716	1 837	6 935	4 110	11 771
6-axle refrigerated semitrailer	5 066	9 534	10 832	1 837	4 530	4 110	8 157
6-axle pantech semitrailer	5 066	9 534	10 832	1 837	4 530	4 110	8 157
Flat top B-double	8 506	15 726	18 980	3 741	8 272	8 984	16 638
Double road train tipper	1 402	4 207	18 574	na	na	578	3 163
Flat top double road train	1 402	6 545	24 227	na	na	578	5 318
Stuart Highway							
5-axle flat top semitrailer	7 140	20 031	na	1 066	5 841	3 011	10 496
6-axle flat top semitrailer	5 066	13 523	11 716	1 837	6 935	4 110	11 771

na Not available

TABLE 3.14 ABSOLUTE CHANGE IN VEHICLE OPERATING COSTS — NEW SOUTH WALES

($)

Route and vehicles	OAG Phase 1 Flat fee	OAG Phase 1 Distance based	OAG Phase 2	Weighted average of State charges Flat fee	Weighted average of State charges Distance based	NSW charges Flat fee	NSW charges Distance based
Mitchell Highway							
Far north-west New South Wales							
2-axle 8-tonne rigid pantechnicon	–768	–768	–768	–306	2 043	0	3 358
2-axle 8-tonne flat top rigid	–768	–768	–768	–306	1 559	0	2 667
3-axle 12-tonne flat top rigid	–1 351	–934	na	–475	1 818	0	3 085
6-axle flat top semitrailer	956	5 424	6 722	–2 273	420	0	4 047
6-axle semitrailer stockcrate	956	5 424	6 722	–2 273	420	0	4 047
Flat top double road train	824	1 292	12 343	na	na	0	431
Double road train tipper	824	1 292	12 343	na	na	0	431
Double road train stockcrate	824	1 292	12 343	na	na	0	431

na Not available

TABLE 3.15 ABSOLUTE CHANGE IN VEHICLE OPERATING COSTS — TASMANIA

($)

Route and vehicles	OAG Phase 1 Flat fee	OAG Phase 1 Distance based	OAG Phase 2	Weighted average of State charges Flat fee	Weighted average of State charges Distance based	NSW charges Flat fee	NSW charges Distance based
Murchison Highway							
Burnie to Queenstown							
3-axle rigid tipper/2-axle pig	8 250	13 763	4 137	1 065	2 445	2 946	5 447
5-axle semitrailer tipper	8 250	5 396	na	2 176	1 119	4 121	2 464
6-axle semitrailer tipper	6 425	6 904	7 769	3 196	3 485	5 469	5 903
6-axle flat top semitrailer	6 425	5 308	6 000	3 196	2 523	5 469	4 457
6-axle semitrailer tanker	6 425	4 191	4 762	3 196	1 849	5 469	3 445

na Not available

TABLE 3.16 PERCENTAGE CHANGE IN VEHICLE OPERATING COSTS — NORTHERN TERRITORY

(per cent)

Route and vehicles	OAG Phase 1		OAG Phase 2	Weighted average of State charges		NSW charges	
	Flat fee	Distance based		Flat fee	Distance based	Flat fee	Distance based
Stuart Highway							
Alice Springs to Darwin							
Triple road train refrigerated	2.0	4.5	9.0	0.6	1.5	na	na
Triple road train pantechnicon	2.0	5.5	9.2	0.6	1.9	na	na
Triple road train tanker	1.9	5.3	8.9	0.6	1.8	na	na
Triple road train flat top	2.1	6.2	9.9	0.6	2.1	na	na
Darwin to Katherine							
Double road train pantechnicon	3.4	5.6	14.3	na	na	2.9	5.0
Other routes							
Triple road train stockcrate	2.7	5.0	12.4	0.8	1.7	na	na
Tanami Road							
Triple road train tanker	3.3	4.3	11.2	0.9	1.3	na	na

na Not available

TABLE 3.17 PERCENTAGE CHANGE IN VEHICLE OPERATING COSTS — QUEENSLAND

(per cent)

Route and vehicles	OAG Phase 1		OAG Phase 2	Weighted average of State charges		NSW charges	
	Flat fee	Distance based		Flat fee	Distance based	Flat fee	Distance based
Warrego/Landsborough/Barkly Highways							
Brisbane to Mount Isa							
6-axle refrigerated semitrailer	1.7	4.5	4.2	0.5	2.2	1.3	3.9
Flat top double road train	0.9	2.6	9.0	na	na	0.6	2.2
Refrigerated double road train	0.9	1.8	7.1	na	na	0.6	1.4
Warrego/Diamantina Developmental Road							
Brisbane to Windorah							
6-axle flat top semitrailer	2.3	4.9	5.6	0.7	2.2	1.8	4.1
6-axle semitrailer tipper	2.6	4.6	5.3	0.7	2.0	2.0	3.9
6-axle semitrailer stockcrate	2.1	4.6	5.3	0.6	2.1	1.7	3.9
Refrigerated B-double	3.4	5.8	7.0	1.5	3.0	3.6	6.1
Double road train stockcrate	0.9	2.8	9.6	na	na	0.6	2.4
Double road train tanker	0.9	2.5	8.8	na	na	0.6	2.0

na Not available

TABLE 3.18 PERCENTAGE CHANGE IN VEHICLE OPERATING COSTS — WESTERN AUSTRALIA

(per cent)

Route and vehicles	OAG Phase 1 Flat fee	OAG Phase 1 Distance based	OAG Phase 2	Weighted average of State charges Flat fee	Weighted average of State charges Distance based	NSW charges Flat fee	NSW charges Distance based
North West Coastal Highway							
Perth to Port Hedland							
6-axle flat top semitrailer	2.5	5.7	5.6	0.9	2.9	2.0	4.9
6-axle semitrailer pantechnicon	2.9	4.9	5.6	1.1	2.3	2.4	4.2
Flat top double road train	1.5	4.0	10.0	na	na	1.1	3.5
Refrigerated double road train	0.9	3.7	6.2	na	na	0.7	3.3
Double road train pantechnicon	1.0	4.8	6.8	na	na	0.8	4.3
Double road train tanker	1.1	3.5	7.5	na	na	0.9	3.1
Triple road train tipper	1.5	4.2	9.2	0.0	1.0	na	na
Triple road train pantechnicon	1.5	6.0	9.1	0.0	1.7	na	na
Flat top triple road train	1.6	6.4	9.6	0.0	1.8	na	na
Refrigerated triple road train	1.3	5.0	7.6	0.0	1.4	na	na

na Not available

TABLE 3.19 PERCENTAGE CHANGE IN VEHICLE OPERATING COSTS — SOUTH AUSTRALIA

(per cent)

Route and vehicles	OAG Phase 1 Flat fee	OAG Phase 1 Distance based	OAG Phase 2	Weighted average of State charges Flat fee	Weighted average of State charges Distance based	NSW charges Flat fee	NSW charges Distance based
Eyre Peninsula							
6-axle flat top semitrailer	2.7	4.2	4.8	1.0	1.9	2.2	3.6
6-axle semitrailer tipper	2.8	4.8	5.4	1.0	2.2	2.2	4.1
6-axle semitrailer stockcrate	2.0	5.2	4.5	0.7	2.7	1.6	4.5
6-axle refrigerated semitrailer	2.0	3.7	4.2	0.7	1.8	1.6	3.2
6-axle pantech semitrailer	2.1	3.9	4.5	0.8	1.9	1.7	3.4
Flat top B-double	3.1	5.7	6.9	1.4	3.0	3.3	6.0
Double road train tipper	0.8	2.3	10.4	na	na	0.3	1.8
Flat top double road train	0.5	2.4	8.7	na	na	0.2	1.9
Stuart Highway							
5-axle flat top semitrailer	2.7	7.7	na	0.4	2.2	1.2	4.0
6-axle flat top semitrailer	1.9	5.0	4.3	0.7	2.6	1.5	4.4

na Not available

TABLE 3.20 PERCENTAGE CHANGE IN VEHICLE OPERATING COSTS — NEW SOUTH WALES

(per cent)

Route and vehicles	*OAG Phase 1*		*OAG Phase 2*	*Weighted average of State charges*		*NSW charges*	
	Flat fee	*Distance based*		*Flat fee*	*Distance based*	*Flat fee*	*Distance based*
Mitchell Highway							
Far north-west New South Wales							
2-axle 8-tonne rigid pantech	–0.8	–0.8	–0.8	–0.3	2.1	0.0	3.4
2-axle 8-tonne flat top rigid	–1.0	–1.0	–1.0	–0.4	2.1	0.0	3.6
3-axle 12-tonne flat top rigid	–1.4	–1.0	na	–0.5	1.9	0.0	3.1
6-axle flat top semitrailer	0.4	2.4	2.9	–1.0	0.2	0.0	1.8
6-axle semitrailer stockcrate	0.4	2.5	3.2	–1.1	0.2	0.0	1.9
Flat top double road train	0.4	0.7	6.6	na	na	0.0	0.2
Double road train tipper	0.3	0.5	5.2	na	na	0.0	0.2
Double road train stockcrate	0.4	0.6	5.7	na	na	0.0	0.2

na Not available

TABLE 3.21 PERCENTAGE CHANGE IN VEHICLE OPERATING COSTS — TASMANIA

(per cent)

Route and vehicles	*OAG Phase 1*		*OAG Phase 2*	*Weighted average of State charges*		*NSW charges*	
	Flat fee	*Distance based*		*Flat fee*	*Distance based*	*Flat fee*	*Distance based*
Murchison Highway							
Burnie to Queenstown							
3-axle rigid tipper/2-axle pig	8.6	14.3	4.3	1.1	2.5	3.1	5.7
5-axle semitrailer tipper	7.4	4.9	na	2.0	1.0	3.7	2.2
6-axle semitrailer tipper	4.5	4.8	5.4	2.2	2.4	3.8	4.1
6-axle flat top semitrailer	6.0	4.9	5.6	3.0	2.3	5.1	4.1
6-axle semitrailer tanker	3.6	2.3	2.7	1.8	1.0	3.1	1.9

na Not available

CHAPTER 4 IMPACT OF CHANGES TO ROAD USER CHARGES ON QUEENSLAND BROADACRE FARMS

INTRODUCTION

In 1990 the Queensland Department of Transport commissioned a one-off survey of farm vehicle ownership and use, to aid its analysis of possible new road user charges. The survey was conducted by the Australian Bureau of Agricultural and Resource Economics (ABARE) as a supplementary collection to its annual survey of Queensland broadacre farms, as part of the Australian Agricultural and Grazing Industry Survey.

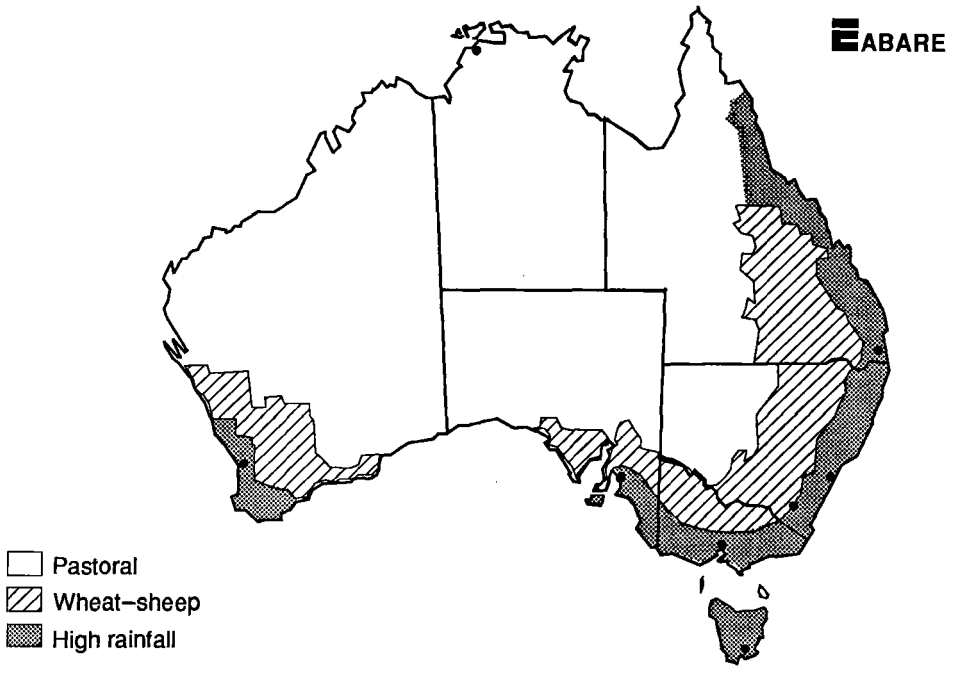
The data collected in the survey are among the most detailed available on Australian farm trucks. The survey is also one of the few sources which can be used to estimate how registration charges affect a particular group of vehicle owners. For these reasons a case study was undertaken on how the Queensland broadacre industry would be affected by the seven charging scenarios detailed in appendix I. The results of that analysis are summarised in this chapter. Release by the Queensland Department of Transport of the aggregate survey data necessary for this analysis is gratefully acknowledged.

Primary producers are an important case study because they currently receive a range of vehicle fee reductions not given to most road users. Consequently, they could be among the most adversely affected by a change in registration arrangements not incorporating relevant rebates.

SURVEY COVERAGE

The farm vehicle survey covered farms that were in one of the five industries known collectively as broadacre agriculture. These industries are wheat and other crops, mixed livestock–crops, sheep, beef, and sheep–beef (see ABARE 1991 for descriptions of these). Although other sectors such as the sugar industry were not included in the survey, it does cover the majority of Queensland agriculture.

Survey results were analysed at both the State level and by three geographic zones defined by the principal land use. These zones are termed pastoral,



Source ABARE.

Figure 4.1 Broadacre industries survey zones

wheat–sheep and high rainfall (see figure 4.1). The pastoral zone is a region of low rainfall which is characterised by large farms engaged in extensive grazing of native pastures. Greater rainfall enables cropping and more intensive grazing of sheep and cattle in the wheat–sheep zone. The high rainfall zone covers most of the eastern coastal strip of the State and is used principally for intensive grazing and fodder crop production.

The wheat–sheep zone contained the majority of farms (7145) in 1989–90. The pastoral and high rainfall zones had 2239 and 3805 farms respectively. In terms of area, the pastoral zone is by far the largest. In 1989–90, the average farm size was 67 215 hectares compared to 3054 and 3797 hectares in the wheat–sheep and high rainfall zones respectively.

PROFILE OF TRUCK USE

Table 4.1 summarises the results of the farm vehicle survey. In 1989–90, 53 per cent of all broadacre farms had a 2-axle rigid truck and 18 per cent had a 3-axle rigid truck. The proportion of farms owning a rigid truck was highest in the wheat–sheep zone at 80 per cent.

Approximately 9 per cent of broadacre farms owned a semitrailer in 1989–90. The proportion of farms owning a semitrailer in the wheat–sheep zone (12 per

TABLE 4.1 PROFILE OF VEHICLE OWNERSHIP AND USE, QUEENSLAND BROADACRE FARMS 1989–90

	Pastoral zone	*Wheat–sheep zone*	*High rainfall zone*	*All zones*
Proportion of farms owning relevant vehicle (per cent)				
2-axle rigid	49	61	41	53
3-axle rigid	10	20	19	18
All rigid trucks	60	80	60	71
4-axle semitrailer	2	2	0	2
5-axle semitrailer	2	5	3	4
5-axle semitrailer	3	4	2	3
All semitrailers	7	12	6	9
Average gross mass per vehicle (tonnes)				
2-axle rigid	10.3 (4)	8.9 (2)	9.2 (3)	9.2 (1)
3-axle rigid	15.6 (2)	18.6 (1)	11.2 (2)	16.0 (1)
2-axle prime mover	29.8 (1)	18.2 (1)	na	20.9 (1)
3-axle prime mover	30.2 (2)	38.9 (1)	24.7 (1)	34.7 (1)
Average annual distance per vehicle (kilometres)				
2-axle rigid	9 313 (18)	3 480 (20)	11 497 (48)	6 370 (23)
3-axle rigid	7 893 (37)	3 678 (28)	12 879 (54)	6 561 (30)
2-axle prime mover	32 415 (75)[a]	1 379 (70)	na	10 481 (66)
3-axle prime mover	8 845 (39)	11 100 (38)	12 024 (72)	11 133 (31)

na Not available

a. This survey estimate has a very large standard error, so extreme caution should be exercised when using it for analysis. It is estimated that there is roughly a 1 in 3 probability that the true (census) value is either below 8100 km or above 56 000 km.

Note Figures in parentheses are relative standard errors, expressed as a percentage of the estimate. The larger is this number, the less reliable is the estimate.

Sources Queensland Department of Transport; Australian Bureau of Agricultural and Resource Economics.

cent) was about double that for other zones. In the wheat–sheep and high rainfall zones, 5- and 6-axle vehicles dominated the semitrailer fleet. In the pastoral zone there was an even distribution between 4-, 5- and 6-axle vehicles.

Annual distances travelled by Queensland broadacre farm trucks were, on average, relatively low. Table 4.2 compares average annual farm truck distances with national averages from the ABS *Survey of Motor Vehicle Use* (see ABS 1990 for details) and those used by the Overarching Group (1991) in its calculations. In the case of rigid trucks, it appears Queensland broadacre vehicles travel annual distances which are, on average, less than half that reported for the nation as a whole. For semitrailers, farm vehicles travel annual distances which are only about 10 per cent of the national average.

TABLE 4.2 COMPARISON OF AVERAGE ANNUAL VEHICLE DISTANCES

(kilometres)

Vehicle	*National average*[a]	*Overarching Group average*[b]	*Queensland broadacre farmers*[c]	
Rigid trucks				
2-axle	15 400	22 100	6 370	(23)
3-axle	20 900	30 000	6 561	(30)
6-axle semitrailer	109 800	94 000	11 133	(31)

a. These are from Inter-State Commission (1990), vol. 2, Appendices.

b. Average distances used by Overarching Group (1991) to estimate indicative charges.

c. Averages from ABARE's 1989–90 Australian Agricultural and Grazing Industries Survey.

Note Figures in parentheses are relative standard errors, expressed as a percentage of the estimate. The larger this number, the less reliable is the estimate.

Sources Queensland Department of Transport; Australian Bureau of Agricultural and Resource Economics; Inter-State Commission.

Caution needs to be used when interpreting average distance estimates from the survey. Because only a small number of farms are used to produce the survey estimates, there is a relatively high degree of sampling error. Even after allowing for these errors, it is still apparent that farm vehicles travel distances well below the corresponding average of those used outside the farm sector.

To give a guide to the reliability of the estimates, standard errors are given in parentheses in tables 4.1 and 4.2 (expressed as a percentage of the estimate). There is roughly a 2 in 3 probability that a survey estimate is within 1 standard error of the true (census) value and a 95 per cent chance that it is within 2 standard errors of the census value.

To find the size of the standard error around an estimate it is necessary to multiply the relative standard error by the survey estimate and divide by 100. For example, in the case of a 2-axle rigid truck in the pastoral zone, the standard error for the average distance estimate is 1676 kilometres (9313 x 0.18). Hence, there is roughly a 1 in 3 chance that the census value is between 7637 kilometres and 10 989 kilometres. There is a 95 per cent chance that the census value lies between 5960 and 12 666 kilometres.

Representative vehicle types analysed

Rather than calculate the effects on each individual farm, cost changes were analysed for five representative vehicle types in each zone. All costings were

undertaken in January 1991 dollars using the physical data (numbers owned, distances travelled etc) obtained from the 1989–90 farm vehicle survey. The representative vehicle types and their associated January 1991 registration charges payable by Queensland primary producers were:

Rigid truck (2-axle)	$284
Rigid truck (3-axle)	$464
Semitrailer (4-axle)	$748
Semitrailer (5-axle)	$814
Semitrailer (6-axle)	$1 003

These registration charges include the 75 per cent up-front rebate which Queensland farmers receive for all heavy vehicles except articulated vehicle trailers, which in all cases cost $250 to register. For example, the $1003 cost of registering a 6-axle semitrailer consists of $753 for a 3-axle prime mover and $250 for a trailer.

Queensland farmers currently face substantially lower truck registration charges than most other road users, possibly because farm trucks make limited use of the public road network, and hence do less damage annually than most other vehicles.

The charges shown do not include compulsory third-party insurance or any additional miscellaneous charges levied by the Queensland Department of Transport. These were assumed to remain unchanged under any new scheme.

ESTIMATION OF AVERAGE FARM VEHICLE OPERATING COSTS

Throughout this study, vehicle operating costs were estimated using the Austway commercial road transport costing model (see appendix II for details). Given accurate information, the model is claimed to produce cost estimates within plus or minus 2.25 per cent of those developed by several independent authorities.

The information collected by the farm vehicle survey was, however, insufficient to generate definitive estimates of farm vehicle operating costs. In particular, no data were available on vehicle age, which has a significant effect on items such as depreciation, insurance, fuel, repairs and maintenance costs. It was expected that many farm trucks would be past their economic life for applications outside the specialised case of low distance farm use. For example, Blyth, Noble and Mayers (1987) noted that farmers often used trucks which were more than 15 years old. It was also uncertain to what extent repairs and maintenance might be undertaken on farm, using farm labour and possibly secondhand parts. The treatment of such activity, even if known, would involve additional methodological difficulties.

Nevertheless, in order to provide some indication of the relative order of the impact of altered charges it was decided to produce broad estimates of average

farm vehicle operating costs on the basis of some necessarily broad assumptions and approximations.

Estimates of the approximate values of farm trucks were made by scanning classified advertisements in rural newspapers. Estimates of average operating costs (in January 1991 dollars) were based on the assumption that the average farm truck was over 8 years old and no depreciation was calculated. Given these and numerous other simplifications, and given that the Austway model is essentially designed for full-time commercial road transport operations, the resulting operating cost estimates should be regarded as merely indicative. Consequently, estimated percentage changes in vehicle operating costs caused by possible variations in road user charges should be interpreted with caution.

It should be noted, however, that the preceding qualification does not apply to estimates of absolute changes in road user charges, for which the previously mentioned assumptions and simplifications are not required.

Road user charge scenarios

The seven hypothetical charging scenarios analysed in this study are described in detail in appendix I. They comprise:

- OAG Phase 1 recommendations, on a flat rate basis;
- OAG Phase 1 recommendations on a distance travelled basis;
- OAG Phase 2 recommendations (essentially distance based);
- weighted average of existing State charges on a flat rate basis;
- weighted average of existing State charges on a distance travelled basis;
- New South Wales charges on a flat rate basis.
- New South Wales charges on a distance travelled basis;

None of the charging scenarios analysed included up-front rebates to primary producers. While farmers would be eligible for up-front rebates under the first phase of the scheme proposed by the Overarching Group report (1991), the extent of these rebates was not quantified in the report and so could not be incorporated in this analysis. For reasons of consistency and comparability, it was decided not to incorporate current primary producer fee reductions in the New South Wales and weighted State average scenarios.

EFFECT OF CHARGING SCENARIOS ON VEHICLE OPERATING COSTS

The percentage changes in vehicle operating costs that would occur under each of the seven scenarios are shown in figure 4.2. This diagram is based on the average annual distances reported in table 4.1 for all zones.

Comparison of the effects of the flat charges proposed by Overarching Group (1991) for the first phase of its proposed scheme (OAG Phase 1 flat) with the same charges apportioned on the basis of actual road use (OAG Phase 1 km) highlights the differing effects of flat and distance based charges. The extreme

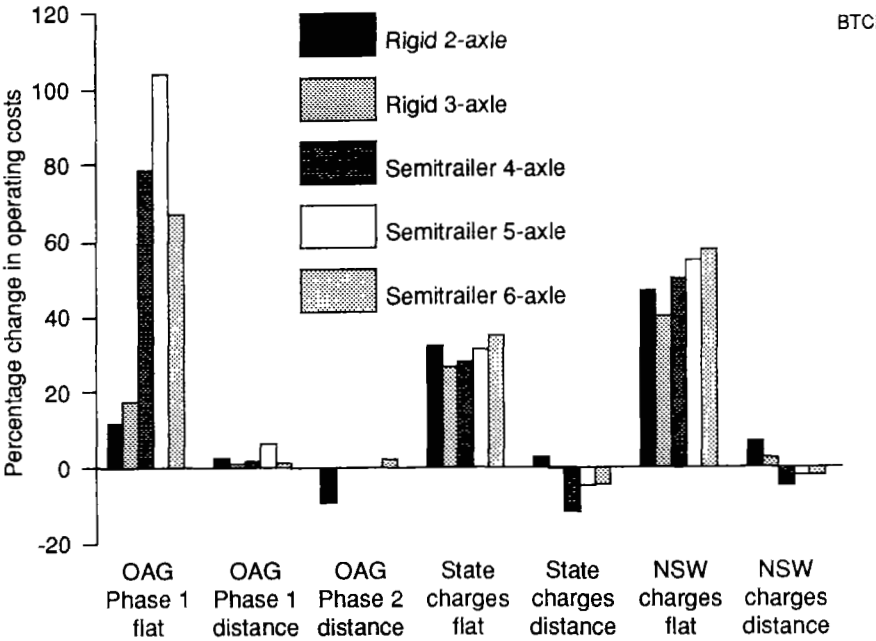


Figure 4.2 Percentage change in vehicle operating costs for each type of farm truck under each charging option

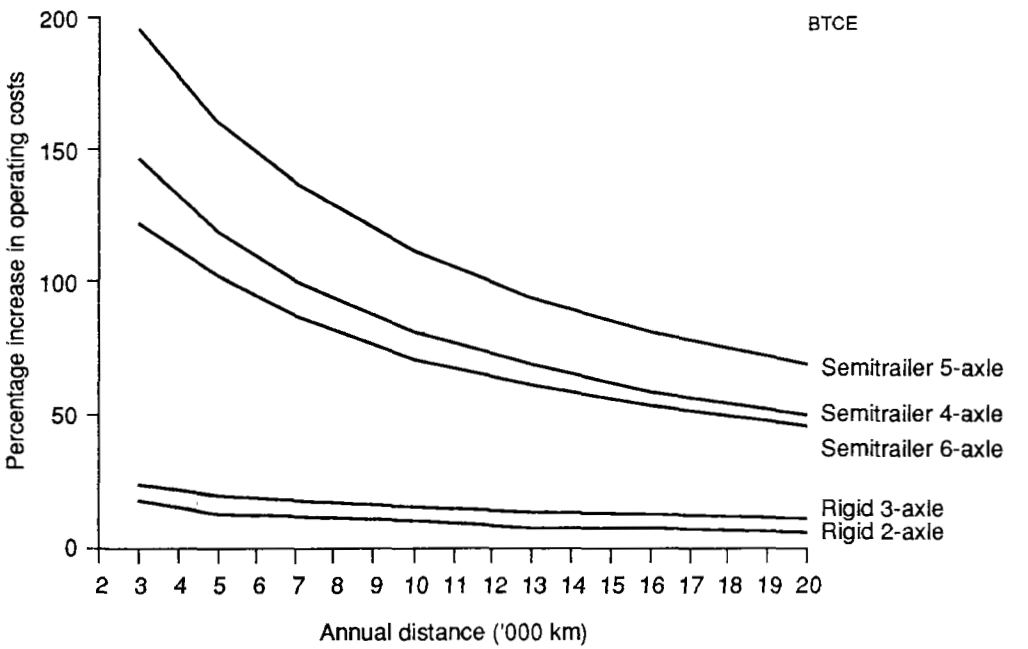


Figure 4.3 *Percentage change in vehicle operating costs for* each type of farm vehicle under OAG Phase 1 flat rate charges over a representative range of distances

TABLE 4.3 POTENTIAL CHANGES IN QUEENSLAND BROADACRE INDUSTRY COSTS 1990–91

($ million)

Zone	OAG Phase 1		OAG Phase 2[b]	Weighted average of State charges[a]		NSW charges[a]	
	Flat fee	Distance based		Flat fee	Distance based	Flat fee	Distance based
Pastoral	1.7	0.0	–0.1	1.9	0.1	2.8	0.3
Wheat–sheep	9.1	–0.6	–0.3	8.8	–1.7	13.5	–1.4
High rainfall	3.1	0.1	–0.1	3.3	0.3	5.1	0.7
All zones[c]	13.9	–0.4	–0.5	14.1	–1.4	21.4	–0.4

a. As at 1 January 1991.

b. This is an underestimate because OAG Phase 2 charges were available only for 2-axle rigid trucks and 6-axle semitrailers.

c. Total for all zones may not equal the sum of individual zonal changes due to rounding.

example of this is a 5-axle semitrailer, whose operating cost rises by the order of 100 per cent with the flat charge but only by some 5 per cent with the distance based fee.

The relative impact on vehicle operating costs of the OAG Phase 1 flat fee scenario usually increases with vehicle size and decreases with the extent of annual distance travelled. These relationships between the relative impact, vehicle size and annual distance are shown in figure 4.3.

Recommended charges under the OAG Phase 2 scenario were provided only for 6-axle semitrailers and for 2-axle rigid trucks. For 6-axle semitrailers, vehicle operating costs could rise by about 2 per cent at the all zones level compared to current costs. Operating costs could fall by about 9 per cent for 2-axle rigid trucks. These small changes suggest that present Queensland charges for primary producers may be reasonably close to the level required to recover actual road costs as calculated by the OAG.

Moving from OAG Phase 1 (flat) to OAG Phase 2 as envisaged in Overarching Group (1991) would reduce 6-axle semitrailer operating costs by about 39 per cent at the all zones level. The corresponding fall for a 2-axle rigid would be about 19 per cent. This reflects the distance based character of the Phase 2 scheme as opposed to the flat fee nature of the Phase 1 scheme, which is based on a distance travelled significantly in excess of that undertaken by farm vehicles.

Like OAG Phase 1, application of the weighted average of State charges (without rebates) as a flat fee would lead to much greater cost increases than its distance based counterpart. However, the percentage cost increases would vary less between vehicle types than OAG Phase 1 flat charges.

The two charging scenarios based on New South Wales fees (without rebates) would have similar effects to their counterparts using the weighted average of State charges. However, the increase in costs would always be higher because New South Wales has the highest State registration fees.

EFFECT OF CHARGING SCENARIOS ON INDUSTRY COSTS

The estimated changes in individual vehicle operating costs (in absolute terms) were combined with information about vehicle ownership to calculate the aggregate change in broadacre industry costs. The results of these calculations are shown in table 4.3 and are based on a schedule of charges current at 1 January 1991 and implicitly assume unchanged farm vehicle ownership patterns from 1989–90.

Of the proposals made by the Overarching Group (1991), its first phase flat charge scheme (unrebated) would clearly be the most detrimental. In January 1991 dollars, it would increase broadacre industry costs by about $14 million. Most of this increase would occur in the wheat–sheep zone, because the majority of farm trucks were in that region. About 60 per cent of all rigid trucks owned by the Queensland broadacre industry were in the wheat–sheep zone and about 68 per cent of all semitrailers were in that zone.

The distance based version of the OAG Phase 1 scenario would reduce costs in the wheat–sheep zone by $0.6 million as a result of the low annual distances travelled. Other zones would experience a slight increase in costs for an overall net decrease across all zones of $0.4 million.

The estimates for OAG Phase 2 show that aggregate cost reductions would occur in all zones for 6-axle semitrailers and 2-axle rigid trucks combined. In this case, decreases for rigid trucks would outweigh slight increases for semitrailers. As noted previously, the estimates for this scheme do not cover other farm vehicles because the relevant charges were unavailable.

Using the unrebated New South Wales flat charges would have caused the greatest increase in costs. Over all zones, costs would have increased by $21 million. Use of the unrebated weighted average of State charges would have reduced this effect to $14 million. The distance based equivalents of these two charging scenarios would have had a relatively minor impact on industry costs.

Sensitivity analysis

Because the average annual distances used to produce the distance based columns in table 4.3 have relatively large sampling errors, the implications of using distances 50 per cent above and 50 per cent below the survey averages were examined. These changes have no effect on the flat charge columns in table 4.3 because the same fee applies irrespective of annual distance travelled.

TABLE 4.4 BOUNDS ON COST INCREASES FOR DISTANCE BASED CHARGING SCENARIOS 1990–91

($ million)

	OAG Phase 1		*Weighted average of State charges*[a]		*NSW charges*[a]	
Zone	*Lower bound*	*Upper bound*	*Lower bound*	*Upper bound*	*Lower bound*	*Upper bound*
Pastoral	–0.1	0.1	–0.2	0.4	–0.1	0.8
Wheat–sheep	–0.8	–0.4	–2.2	–1.2	–2.0	–0.8
High rainfall	–0.1	0.4	–0.4	0.9	–0.1	1.5
All zones[b]	–1.0	0.1	–2.8	0.0	–2.3	1.4

a. As at 1 January 1991.

b. Total for all zones may not equal the sum of individual zonal changes due to rounding.

Table 4.4 shows illustrative lower and upper bounds for each distance based charging scenario, except OAG Phase 2, for which insufficient detail was available.

The largest difference between lower and upper bounds was $3.7 million under the New South Wales charging scenario at the all zones level. The comparable difference using the weighted average of State charges was $2.8 million. For OAG Phase 1 (distance based) option it was $1.1 million. In all cases, the difference between bounds was never more than 0.5 per cent of the total farm cash costs for the relevant zone.

The sensitivity analysis highlights how the effects and the ranking of the distance based charging scenarios can vary, in terms of the cost changes they would generate. The OAG Phase 1 charges vary least with distance, the New South Wales charges vary most with distance. One result of this is that at lower bound distances, the New South Wales charges would be relatively advantageous to farmers, offering total savings of about $2.3 million; while at upper bound distances, the New South Wales charges would be the most adverse to farmers, entailing aggregate cost increases of $1.4 million. The weighted average of State charges scenario would produce the largest cost decrease or smallest cost increase at the all zones level, for all distances. However, this would not always hold for the individual zones. For example, in the pastoral zone with upper bound distances, the OAG Phase 1 scheme would produce the smallest cost increase.

These changes in effects and ranking are caused by the interaction between the types of vehicles owned in each region, annual distances travelled and differences in charges between vehicle types and from the 1991 Queensland level. From the above examples it is clear that in the general case it is not possible to state that one distance based scheme would necessarily generate lower cost increases than another.

TABLE 4.5 POTENTIAL CHANGES IN QUEENSLAND BROADACRE FARM CASH INCOME 1990–91

(per cent)

Zone	OAG Phase 1		OAG Phase 2[a]	Weighted average of State charges[b]		NSW charges[b]	
	Flat fee	Distance based		Flat fee	Distance based	Flat fee	Distance based
Pastoral	–1.1	0.0	0.1	–1.3	–0.1	–1.9	-0.2
Wheat-sheep	–4.0	0.3	0.1	–3.9	0.7	–5.9	0.6
High rainfall	–2.4	–0.1	0.1	–2.6	–0.2	–3.9	–0.5
All zones	–2.7	0.1	0.1	–2.8	0.3	–4.2	0.1

a. This is an underestimate because OAG Phase 2 charges were available only for 2-axle rigid trucks and 6-axle semitrailers.

b. As at 1 January 1991.

EFFECT OF COST INCREASES ON INDUSTRY INCOME

Table 4.5 shows the impact of altered charges (using average annual distances) expressed as a proportion of 1990–91 broadacre farm cash income. Farm cash income is defined as the difference between total cash receipts and total cash costs and can vary substantially from year to year. The percentage increases calculated provide an indication of the relative impact of altered charges in just one year, the most recent for which data were available. Note that impact could be appreciably different in another given year. For example, average farm cash income in 1989–90 for the pastoral zone ($103 405) was much higher than in 1990–91 ($67 904). Conversely, average farm cash income in 1989–90 for the high rainfall zone ($21 202) was much less than in 1990–91 ($34 287). Incomes for the wheat–sheep zone did not vary greatly between these two same years ($32 299 and $31 980 respectively).

In 1990–91, the greatest potential impacts would have tended to occur in the wheat–sheep zone because of its higher incidence of relevant farm vehicle ownership and because it had the lowest average farm cash income in 1990–91 of $31 980. The estimated impacts range from a 5.9 per cent income reduction under New South Wales flat charges in the wheat–sheep zone to a 0.7 per cent increase under the distance based weighted average of State charges in the same zone.

Consideration was given to analysing the relative effects of altered charges across different farm income groups. However, the small number of farms surveyed meant that the results of such a breakdown would have had unacceptably high standard errors and would lack statistical validity.

CONCLUDING COMMENTS

The impacts of the seven charging scenarios analysed depend heavily on the composition of the truck fleet and its use. For the Queensland broadacre industry in 1990–91, the wheat–sheep zone would have experienced the greatest cost increase in absolute dollar terms under each scenario because the majority of broadacre farm vehicles were in that zone. In addition, semitrailers, which typically incur the greatest increase in road user charges, were about twice as common in the wheat–sheep zone as in the other two zones. Expressed as a proportion of 1990–91 industry farm cash income, the cost increases would also have had the greatest impact in the wheat–sheep zone, further reflecting the lower average farm income levels in that region in 1990–91.

Use of distance based road user charges would in all cases have resulted in relatively minor changes. If the OAG Phase 1 and 2 distance based fees approximate the actual cost of road use per kilometre, then this suggests that current Queensland charges (with primary producers rebate) may be reasonably close to the level required to recover road costs. If this is the case, then primary producers could be significantly overcharged by the corresponding OAG Phase 1 flat fees (excluding any rebate), which result in large cost increases. In effect, broadacre farmers would be subsidising those who make more extensive use of public roads. In the case of a 5-axle semitrailer, farmers travelling the average annual distance of 11 133 km would be charged $6600 more than the $1140 that would be appropriate for their limited use of the road system.

The overcharging of low distance vehicles is an inherent problem with any of the flat fees examined. One solution to this is to give up-front rebates for low distance vehicles, as is currently done for Queensland primary producers and was envisaged but not quantified in Overarching Group (1991). Adoption of a scheme which charges on the basis of road use (for example, kilometres travelled or short-term registration) is an alternative solution but is likely to involve greater administration and enforcement costs.

CHAPTER 5 IMPACT OF CHANGES TO ROAD USER CHARGES ON THE BEEF CATTLE INDUSTRY IN THE NORTHERN TERRITORY

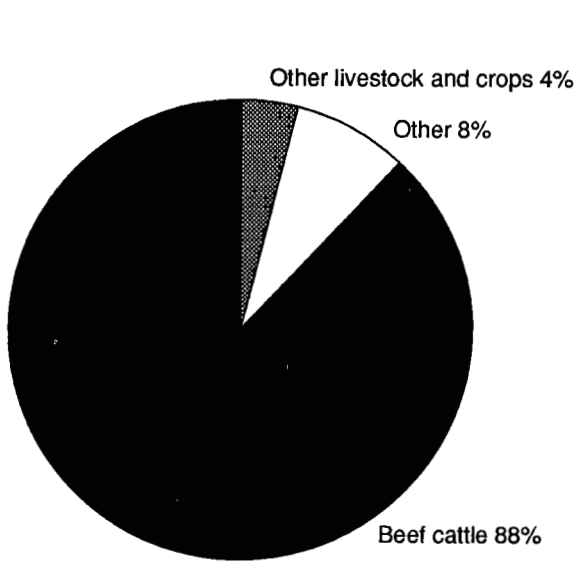
INTRODUCTION

Producers in remote areas could be among those most affected by some new road pricing policies due to their almost complete dependence on road transport to move inputs and outputs over long distances. In this chapter an assessment is provided of the impacts of various policy options on costs at farm level in one of these remote areas, the Northern Territory, a region where beef production is the dominant industry. All of the seven road user charging scenarios outlined in appendix I were considered. As the basis for modelling the impacts ABARE used data obtained from its 1990–91 Australian agricultural and grazing industry survey (AAGIS). The nature of this survey is described in detail in ABARE (1991).

It is important to note that only the initial or first-round effects of the new pricing policies are reported in this analysis. Second-round effects arise from the adjustments that farmers make to their operations in response to changes in the relative prices for their inputs, products and transport options. In general, second-round effects will partially offset the initial effects of a policy change but they will be small when producers have a limited range of production and transport alternatives. Assessment of these second-round effects would require more time than was available for this study. Therefore, the results reported here should be regarded as indicative only and the qualifications discussed at the end of the report noted.

NATURE OF THE NORTHERN TERRITORY BEEF INDUSTRY

As a result of its climate and topography, land use in the Northern Territory is limited primarily to extensive grazing of beef cattle on native pastures. On an average per farm basis in broadacre farming, sales of beef cattle accounted for 88 per cent of total cash receipts in 1990–91 (figure 5.1). A small amount of grain is produced but this is mainly for manufacture into stock feeds for local consumption. In 1990–91 the gross value of beef and veal production was estimated to be nearly $116 million, making the beef industry the largest single agricultural industry in the Northern Territory.



Source ABARE.

Figure 5.1 Shares in total farm cash receipts, Northern Territory, 1990–91 (preliminary) (average per broadacre farm)

Depending on seasonal conditions, the Northern Territory beef industry is oriented toward the production of store cattle or cattle fattened on native pastures. Cattle are mainly sold on an over-the-hooks basis or at auction. However, around 25 per cent are sold privately in the paddock. Although the producer is likely to receive a lower price with paddock sales, under this method the producer avoids paying freight directly. An increasing number of cattle are now also being sold through the Computer Aided Livestock Marketing (CALM) electronic selling system.

TABLE 5.1 COMPARISON OF BEEF INDUSTRY STATISTICS, 1990–91[p]
(average per broadacre farm)

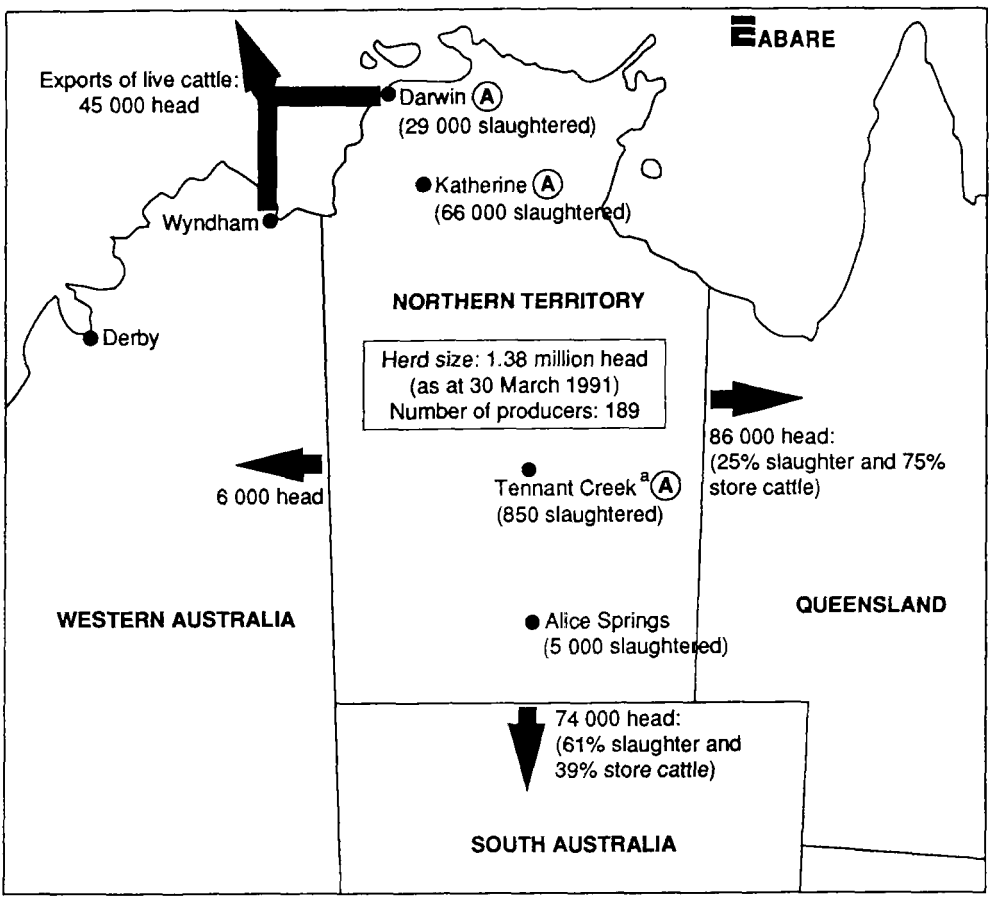
Item	*New South Wales*	*Victoria*	*Queensland*	*Northern Territory*
Total farm area (hectares)	811 (25)	195 (9)	18 295 (18)	347 727 (17)
Beef cattle carried (no.)	365 (9)	228 (7)	1175 (7)	6 867 (24)

p Preliminary estimates

Note Figures in parentheses are relative standard errors, expressed as percentages of estimates.

Beef properties in the Northern Territory tend to be very large compared with those in other States, reflecting the low carrying capacity of the land being used (table 5.1). In 1990–91, the average size of a property in the Northern Territory was around 348 000 hectares. This contrasts, for example, with the average size of a beef property in New South Wales, 811 hectares. As the size of properties in the Northern Territory is so large, properties are usually quite remote with large distances to be travelled when moving cattle to markets and when transporting supplies from the nearest town centre. The only rail link in the Territory is between Alice Springs and Adelaide. Beef operations in the Northern Territory, therefore, are heavily dependent on road transport.

The pattern of cattle movements in the Territory in 1990–91 is shown in figure 5.2. Within the Northern Territory the largest export abattoir is located at



(A) Abattoir

a Commenced operating in January 1991.

Source Northern Territory Department of Primary Industry and Fisheries (1992).

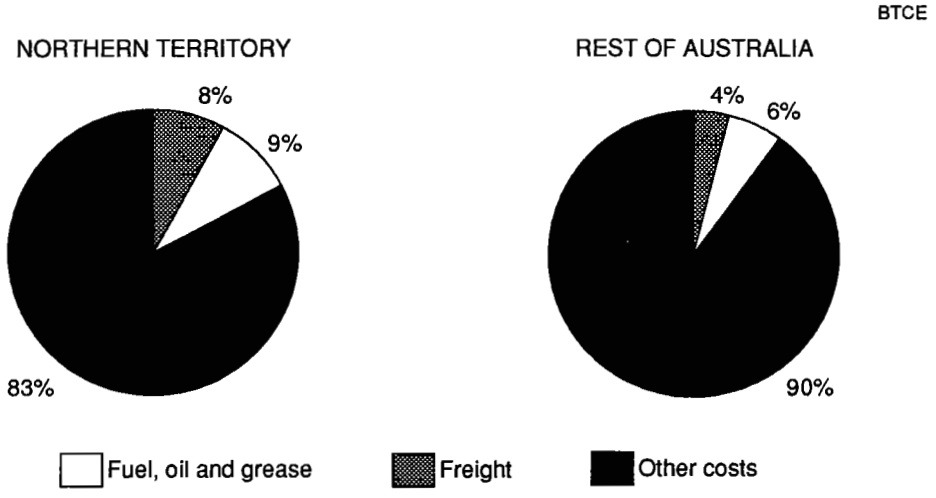
Figure 5.2 Cattle movements in the Northern Territory, 1990–91 (preliminary)

Katherine, accounting for nearly 60 per cent of total slaughterings. Export abattoirs also operate at Tennant Creek and at Batchelor, near Darwin. There are other smaller abattoirs operating in various parts of the Northern Territory which account for about 15 per cent of total slaughterings but none of these has an export licence. The largest saleyards for cattle are located at Alice Springs.

Approximately half of the cattle turned off in the Northern Territory are moved interstate, predominantly to South Australia and Queensland. One reason for these movements is to fatten cattle in areas where pasture is more abundant and grain is cheaper. A number of Northern Territory beef producers own properties in other States specifically for this purpose. Finished cattle are also moved to markets in Adelaide and in northern Queensland. A large proportion of the cattle sent to South Australia go by rail.

Live cattle are exported from the Northern Territory to major markets in South-East Asia, particularly the Philippines. In 1990–91, around 45 000 head of live cattle were shipped to overseas markets (Northern Territory Department of Primary Industry and Fisheries 1992). These exports are usually loaded at either Darwin or Wyndham in Western Australia.

Seasonal conditions, particularly in the northern part of the Northern Territory, limit the movement of cattle to certain parts of the year. In particular, the onset of the wet season (monsoon) in the summer months in the north of the Territory restricts cattle movements to between April and November. The need to avoid the hottest parts of the year means that cattle movements in the southern areas are also largely undertaken in this same period. Given the large herd sizes and the restricted period of time in which cattle can be moved, cattle are generally freighted in large numbers at any one time.



Source ABARE.

Figure 5.3 Components of total cash costs of beef specialist farms in the Northern Territory and the rest of Australia, 1990–91 (preliminary)

The importance of road transport to the cash costs of beef enterprises in the Northern Territory is illustrated in figure 5.3. The shares in average farm costs of freight (cash paid to commercial carriers) and of fuel, oil and grease are higher for the Northern Territory than for beef specialist producers as a whole in the rest of Australia. For this reason alone changes to road charging arrangements may have a larger impact on beef producers in the Northern Territory than on other areas of the Australian beef industry.

EFFECTS OF NEW CHARGING ARRANGEMENTS

Under current arrangements, road users pay registration charges and taxes on fuel. It was not envisaged that total fuel charges would vary with any new charging arrangements, so this analysis deals only with the effects of replacing registration costs with some form of fixed or variable 'mass–distance' charge. For the purposes of this analysis, these effects are categorised as first- and second-round effects.

Initial or first-round effects

In 1990–91, registration charges in the Northern Territory were considerably less than in any of the other States. For example, the registration charge for a 6-deck road train at 1 January 1991 was $1579 in the Northern Territory compared with the Australia-wide weighted average of $4231. Consequently any move to a uniform system of charges would increase costs by more than would be the case in any other State or Territory.

Apart from the impact on costs to producers of registering their own trucks, changes in road user charges would also affect commercial freight rates through their effect on the operating costs of commercial hauliers. If registration charges are effectively increased, cost recovery by transport operators may necessitate general increases in the commercial freight rates that growers pay on livestock movements and the cartage of farm supplies.

There is no direct freight cost to producers who sell their cattle in the paddock. However, the buyer incurs the cost of transporting the cattle from the property to the final destination and this cost is a determinant of the price that is offered by the buyer or his agent. An increase in transport costs caused by increases in registration costs is likely to cause a decrease in offer prices for paddock sales, thus reducing producers' sales receipts.

The introduction of a new charging regime may also influence prices received by producers who use other methods of sale. This can be illustrated with the case of cattle sold to an abattoir. It is likely that the transport costs of operating the refrigerated vehicle that moves the meat from abattoir to the export position or domestic outlet would increase under proposed changes. Thus, if demand for the product of the abattoir falls in response to increased prices, net receipts for the abattoir could be expected to decline. To maintain profitability the operators

The actual price effects for each method of sale will be determined by the elasticities of demand and supply (responsiveness to price changes) at each stage of the production and marketing chain, but the likely outcome is that producers generally will receive lower prices for cattle. It is important to note that the impact on prices received by producers will not be uniform throughout the Northern Territory. Generally, producers closest to export positions or local consumption markets are likely to be least adversely affected by increased charges because road transport costs are a smaller proportion of the total costs of moving their cattle through the marketing and processing chain in Australia.

Road transport costs are an important component of the cost of producing and distributing manufactured goods, so higher road user charges may generally increase the prices of these goods throughout Australia. Many of the physical inputs of the Northern Territory beef industry are sourced from other States. Because Northern Territory beef producers are at the end of a particularly long supply chain, the effect on the prices that they pay for inputs could well be higher than for most other agricultural producers in Australia.

Second-round effects

The second-round effects arise from the responses that producers make to the higher charges. For example, producers may register fewer vehicles or switch to vehicles with lower weight or with axle configurations that attract lower charges. In some cases they may be able to shift to alternative modes of transport and change sources and destinations of cattle shipments. In the southern parts of the Northern Territory, where rail transport is an alternative to road movement, a key determinant of changes to the pattern of cattle movements would be how rail freight rates are adjusted in response to higher road freight rates.

Producers may also respond by altering management practices and production mixes. The alternatives to beef production are limited, but the changes in freight rates may shift comparative advantage between producing fat cattle and store cattle. Another second-round effect could be to orient beef production increasingly to those areas closest to markets.

All factors considered, however, it would seem that both the production alternatives to beef and the alternatives to road transport for moving cattle are limited, so that the scope for producers to offset the effects of higher charges by changing the nature of their operations would also seem to be limited.

METHOD OF ESTIMATING EFFECTS OF NEW CHARGING ARRANGEMENTS

The analysis involved making adjustments to farm level data collected by ABARE's AAGIS survey for 1990–91 and a supplementary telephone survey conducted in January 1992. There were thirty Northern Territory properties in the survey but one property was dropped from the sample used in the analysis because of problems with the completeness of data that could be obtained from

the supplementary survey. Given the limited sample size, only farm averages are reported; distributional analyses are not presented.

Because of the complexity associated with evaluating the second-round effects of policy options, this analysis is confined to the estimation of first-round effects. As discussed previously, any new road pricing arrangements will have an impact on the cost of registering the producers' own trucks, the cost of commercial cartage of cattle, the prices received on paddock sales of cattle, prices received on other methods of sale and the cost of farm inputs transported by road. Only the effects on the first three components were estimated; calculations of the effects on input costs and on prices received with other methods of sale were not carried out because of data limitations. The key assumptions and methods of calculating changes to each of the components are described in this section.

It was assumed that the fuel tax would not change with the altered charging arrangements. Implicit in the adjustment procedures for both direct freight on livestock movements and paddock sales revenues is the assumption that additional costs associated with each policy are passed on completely to the users of road freight services.

Registration costs

Registration costs under each of the charging scenarios for each class of vehicle were provided by the BTCE and are set out in appendix I. The change in registration costs was calculated for each vehicle identified in the survey as the difference between the 1990–91 actual charge and the hypothetical charge for that class of vehicle.

Direct freight paid on livestock movements

Ratios of notional freight rates before and after the new pricing regime were used to adjust actual freight costs collected in the survey. Notional freight rates paid on the distance travelled from the property to the place of sale were calculated by first using the Austway model (Austway 1990, see appendix II) to estimate a per kilometre cost (including a return on capital) of operating a typical 6-deck road train in the Northern Territory. Notional operating costs under the various road user charging scenarios are shown in table 5.2. Per kilometre freight rates were then calculated assuming that the road train would be directly earning freight revenue on 47 per cent of the total distance that it travelled (an estimate provided by the BTCE).

Paddock sales revenues

The first-round effects on paddock sales revenues were estimated as the difference between the before and after notional freight costs associated with each paddock sale. Notional freight rates were derived in the manner described above. It was assumed that the road train could carry 150 head of cattle per trip

TABLE 5.2 NORTHERN TERRITORY ROAD TRAIN COSTS UNDER EXISTING AND POTENTIAL REVISED ROAD USER CHARGES[a]
(average $ per broadacre farm)

Scenario	*Annual costs*	*Costs per kilometre*	*Costs per kilometre*[b]
Double road train			
Existing	320 103	2.00	4.26
OAG Phase 1	326 534	2.04	4.34
OAG Phase 2	349 359	2.18	4.65
OAG Phase 1 distance based	331 681	2.07	4.41
Average flat	na	na	na
Average distance based	na	na	na
NSW flat	325 710	2.04	4.33
NSW distance based	330 472	2.07	4.40
Triple road train			
Existing	409 461	2.56	5.45
OAG Phase 1	419 132	2.62	5.58
OAG Phase 2	454 282	2.84	6.04
OAG Phase 1 distance based	426 840	2.67	5.68
Average flat	412 113	2.58	5.48
Average distance based	415 078	2.60	5.52
NSW flat	na	na	na
NSW distance based	na	na	na

na Not available

a. These costs were estimated using the Austway model (Austway 1990). It was assumed that the road train was two years old and travelled 160 000 kilometres per year. Most other parameters of the model were set at default values provided.

b. Assumes that freight revenue is earned directly on 47 per cent of the total distance travelled.

Source BTCE.

RESULTS

Estimates of the effects of the various scenarios at an aggregate level are shown in table 5.3. Each estimate is accompanied by a relative standard error measure. There is roughly a two in three chance that an estimate reported here is within one standard error of the census value, that is, the value which would have been obtained if all properties in the Territory had been surveyed (ABARE 1991).

Under all scenarios, the largest estimated changes would have occurred in the cost of registering graziers' own vehicles, with increases in direct livestock freight costs being the next largest. The estimated declines in paddock sales revenues would have been relatively small in relation to total changes because this is a comparatively minor method of sale.

The largest impact would have occurred with the New South Wales distance based charges and would be an estimated decline of $9801 or nearly 21 per cent of farm

TABLE 5.3 ESTIMATED CHANGES IN FARM CASH COSTS AND RECEIPTS IN THE NORTHERN TERRITORY IN 1990–91 UNDER DIFFERENT ROAD USER CHARGES

(average $ per broadacre farm)

Scenario	*Increase in registration costs*	*Increase in direct livestock freight costs*	*Decrease in paddock sales receipts*	*Total decrease in farm cash income*
OAG Phase 1	1 675 (28)	1 175 (37)	223 (40)	3 073 (26)
OAG Phase 2	na	5 439 (37)	1 041 (40)	na
OAG Phase 1 distance based	3 858 (28)	2 144 (37)	409 (40)	6 411 (26)
Average flat	1 206 (26)	400 (37)	74 (40)	1 681 (25)
Average distance based	4 231 (26)	788 (37)	149 (40)	5 168 (26)
NSW flat[a]	2 617 (25)	1 023 (37)	208 (41)	3 848 (24)
NSW distance based[a]	7 657 (25)	1 780 (38)	363 (41)	9 801 (24)

na Not available

a. NSW charges relate to the operation of double rather than triple road trains.

Note Figures in parentheses are relative standard errors,expressed as percentages of the estimates.

cash income in 1990–91. Note that the New South Wales charges relate to the operation of double rather than triple road trains as the latter are not permitted to operate in New South Wales. The smallest impact (4 per cent) would have occurred with the average flat rate scenario. It is estimated that the OAG Phase 1 scenario would reduce farm cash income by $3073 or nearly 7 per cent. From figure 5.4 it can be seen that the smallest impacts would have occurred with those charging scenarios which are not distance based. Note that estimates of Northern Territory beef cattle farm cash incomes are subject to high standard errors, due to small sample size. These incomes can also vary substantially across seasons.

The impact of each scenario will differ from property to property according to dependence on road transport. In the case of the OAG Phase 1, for example, it is estimated that approximately two-thirds of producers in the Northern Territory would have experienced declines in their farm cash incomes of between $2274 and $3872.

It was possible to do only a partial assessment of the OAG Phase 2 policy because there was incomplete information about registration costs for the different types of vehicles. Direct registration costs on producers' own trucks could not be assessed; it was estimated that direct livestock freight costs would have increased by $5439 and that paddock sales revenues would have decreased by $1041. Both these estimates are about three times higher than would have been the case with the New South Wales distance based scenario.

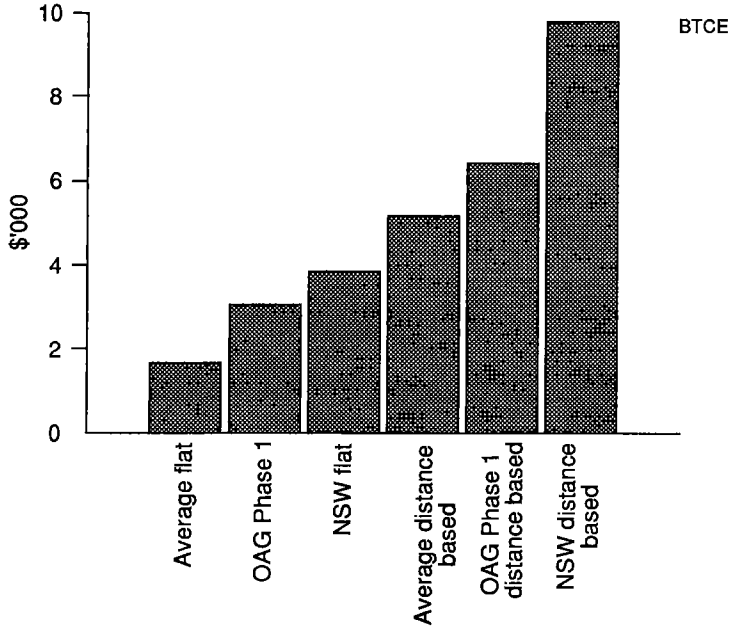


Figure 5.4 Estimated decreases in net farm cash income in the Northern Territory in 1990–91 under different road user charges (average per broadacre farm)

The impacts of all these scenarios are probably underestimated because the effects on input costs are ignored. A further qualification to the results is that the impact of the scenarios may vary from year to year according to the effect of seasonal conditions on the road haulage task. Unusually prolonged dry conditions could increase the number of cattle moved by road because there would be higher turnoff of cattle and increases in transfers and agistments. An abnormally long wet season could reduce the task because it creates problems with the mustering of cattle and movements of trucks. The 1990–91 season was characterised by dry conditions in the southern parts of the Northern Territory and on the Barkley Tablelands, and by high rainfall in the northern areas. This meant that there were relatively high numbers of cattle moved in the first half of the season but relatively low movements in the remainder of the season. In total, the 1990–91 season could probably be considered as a reasonably representative season in terms of cattle movements.

CONCLUSIONS

Estimates are reported of the partial first-round effects of various alternative road charging scenarios on the Northern Territory beef industry under the assumption that they were applied in the 1990–91 season. Because it was not possible to quantify the second-round effects or the impacts on input costs and on prices with some methods of sale, the results should be taken as initial benchmarks of the effects of these policies.

It is estimated that farm cash income would have decreased under all the scenarios that were considered in this analysis. The estimates ranged from 4 per cent of farm cash income in 1990–91 if charges were set at the Australia-wide weighted average of actual charges, to 21 per cent of farm cash income in 1990–91 if charges were set at the New South Wales distance based rate. Estimates of farm cash income are volatile due to small sample size.

These estimates do not make allowance for the fact that a change in road user charges alters relative prices for the different modes of transport and the relative returns for the different production alternatives. A new charging system, therefore, may lead to alterations in production mixes and in the pattern of cattle movements. Such changes were assumed to be small.

CHAPTER 6 IMPACT OF CHANGES TO ROAD USER CHARGES ON GRAIN TRANSPORT COSTS IN EASTERN AUSTRALIA

INTRODUCTION

The Australian grain growing industry is a major contributor to exports, with total export sales of wheat, barley, oats and sorghum returning $2.3 billion in 1990-91. In that year, approximately 30 000 grain growing farms produced 22 megatonnes of grain, 15 megatonnes of which was wheat. 1990–91 could be regarded as a roughly average year, having regard to the large fluctuations that occur in the grains industry. This grain is transported by road and rail through a network of silos and subterminals for domestic consumption and for export by sea. In some cases the grain is taken directly to a domestic destination or to an export terminal by road transport, by either the farmer or an off-farm commercial transport contractor. In most cases, however, the grain is initially delivered to a silo or subterminal using road transport and then further moved to domestic markets or export terminals. In this case transport may be either by road or by rail with the majority of the long-haul trips being by rail.

Any changes to road user charges, such as those being considered by the National Road Transport Commission, will affect the costs of transporting grain by altering the costs of both farm and contractor trucks. Changes to trucking costs may affect the proportion of grain carried by rail and the flow of grains to different ports and destinations, as the comparative cost of various journeys is altered by changing road transport costs. The effects of such changes will be very complex across the whole Australian wheat belt. Their impact can be analysed using a model of the transport system. Such a model has been developed by ABARE for the analysis of the costs of grain storage, handling and transport in eastern Australia.

The Eastern States Grain Storage, Handling and Transport Model is a linear programming model which identifies the least-cost path for grain from the farm to domestic and foreign destinations, throughout the eastern States of Australia (Queensland, New South Wales, Victoria and South Australia). The revised version of the model used for this study is described in Allen, Hall, Noble, Sethi and Blyth (1991), while a full account of the original model's structure is provided in Blyth, Noble and Mayers (1987).

The objective of the model is to minimise total transport, handling and storage costs including port and voyage costs for grains sold for export. The optimising framework can be used to account not only for changes in costs per tonne-kilometre of trucks but also to account for shifts between trucks and railways and the consequent flow-on changes to handling, storage, port and shipping charges.

This model is limited to a system of grain flows and therefore does not reflect gains to the whole Australian community through the more efficient allocation of resources. For example, improved recovery of road damage costs from larger vehicles would allow greater allocation of available services and resources to the users who place the highest value on them. More efficient pricing of services could also help to ensure that additional investment within the grain storage, handling and transport system is more likely to occur within the sectors that can make the best use of it and free to the rest of the community resources in less demand.

SIMULATIONS

The cost coefficients for the model have been revised from those used in Allen et al. (1991). The new costs, supplied to ABARE by the BTCE, are appropriate for 1990–91.

The current total cost of the grain transport, storage and handling tasks from farm gate to export market is estimated within the model at approximately $50 per tonne in 1990–91 dollars. Of this total, shipping accounts for $21 per tonne and land transport and handling $29 per tonne.

The main costs directly relevant to this study are the costs of farm and contractor trucks and of the railways which compete with them. All these costs are specified in the model on a State basis. Within States, rail costs are differentiated between main and branch lines, and truck costs between farm trucks and the larger trucks assumed to be used for contract haulage of grain.

Farm and contractor trucks are affected differently by the different charging scenarios because they are assumed to be different types of vehicle and to carry different loads over various distances. Most farm to local silo trips are specified to be by farm truck whereas journeys beyond the local silo can be made either by contractor truck or by rail. An exception is trips from the farm which cross State borders which are costed on the basis of contractor trucks.

Truck costs for each journey are specified as comprising a handling cost per tonne plus a tonne-kilometre charge. The handling cost per tonne which is incurred for each journey between nodes represents the cost of loading and unloading the truck. This cost differs between States and by truck type. For each State, a cost per tonne-kilometre is specified by BTCE based on the assumed truck characteristics and distance travelled in a year.

The alternative charges analysed are described in appendix 1. In this chapter a comparison is made between the costs for grain transport implied by each of the seven selected charging scenarios. These are compared with a base case of 1990–91 truck costs on the present system. All costs are expressed as changes from those under the base case. None of the seven scenarios analysed takes account of any possible rebates in charges for primary producers such as exist under the current system.

AVERAGE COST CHANGES

The changes in average grain transport and handling costs per tonne associated with the seven scenarios are presented in table 6.1. The costs are the total costs of grain transport, storage, handling and shipping.

There are major differences between the scenarios and between States in the impact on costs. Given that the average total cost of grain transport, storage and handling was estimated at $49.59 per tonne in the base (current) situation, the increases in cost per tonne are relatively small under any of the scenarios examined. The largest impacts stem from the application of NSW flat rates. Small savings occur in New South Wales under two distance based scenarios.

Estimates of the impact on average farm cash income of each scenario for changes in transport and handling charges are presented in table 6.2. The farm cash income estimates are from ABARE surveys (ABARE 1991). The percentage impact is determined by the importance of grain to the farms and by the level of farm cash incomes, expressed in 1990–91 dollars and averaged over the past five years to reduce the impact of income variation between years. The impacts of the scenarios on farm cash income range from a fall of about 3.5 per cent on wheat and other crops farms in Queensland under the NSW flat rate scenario to

TABLE 6.1 CHANGES IN AVERAGE TRANSPORT AND HANDLING COSTS FOR GRAIN
($ per tonne)

Scenario	*New South Wales*	*Victoria*	*Queensland*	*South Australia*
OAG Phase 1	0.2	0.8	1.0	0.7
OAG Phase 2	0.7	0.2	1.1	0.7
OAG Phase 1 distance base	0.5	–0.9	0.3	0.2
NSW flat fee	0.8	1.3	2.1	1.5
NSW distance based	–0.1	0.6	0.5	0.4
Average flat fee	0.4	0.7	1.4	1.0
Average distance based	–0.3	0.5	0.2	0.0
Base average cost[a]	50.90	49.59	56.55	41.29

a. Estimated average cost per tonne of grain of land transport, handling and shipping to export destinations, base scenario 1990–91.

TABLE 6.2 IMPACT OF EACH SCENARIO ON FARM CASH INCOME OF GRAIN GROWING FARMS

	New South Wales	*Victoria*	*Queensland*	*South Australia*
Wheat and other crops industry				
Average farm cash income per farm 1986–87 to 1990–91 (1990–91 prices) ($)	52 424	32 454	34 977	38 594
Change in farm cash income for each scenario (per cent)				
OAG Phase 1	–0.4	–1.2	–1.7	–1.4
OAG Phase 2	–1.3	–0.3	–1.8	–1.4
OAG Phase 1 distance based	–0.9	1.4	–0.5	–0.4
NSW flat fee	–1.5	–2.0	–3.5	–3.0
NSW distance based	0.2	–0.9	–0.8	–0.8
Average flat fee	–0.8	–1.1	–2.4	–2.0
Average distance based	0.6	–0.8	–0.3	0.0
Mixed livestock–crops industry				
Average farm cash income per farm 1986-87 to 1990–91 (1990–91 prices) ($)	37 030	33 638	26 506	33 112
Change in farm cash income for each scenario (per cent)				
OAG Phase 1	–0.2	–0.8	–1.3	–0.9
OAG Phase 2	–0.8	–0.2	–1.4	–0.9
OAG Phase 1 distance based	–0.5	0.9	–0.4	–0.3
NSW flat fee	–0.9	–1.4	–2.6	–1.9
NSW distance based	0.1	–0.6	–0.6	–0.5
Average flat fee	–0.4	–0.7	–1.8	–1.3
Average distance based	0.3	–0.5	–0.3	0.0

an increase of 1.4 per cent for wheat and other crops farms in Victoria under the OAG Phase 1 distance based scenario.

CHANGES BETWEEN ROAD AND RAIL TRANSPORT

On many routes, grain can be transported either by road or by rail; either the two are in direct competition or a change of route will allow grain to be carried on the other mode of transport. When the costs of trucking are altered, as with the scenarios being examined in this case, then shifts between road and rail transport are to be expected as their relative costs are changed. The total tonne-kilometres by road and by rail are presented in table 6.3 for each of the seven scenarios.

All the scenarios except for the average flat rate scenario, lead to a decrease in road traffic. The largest decrease is just under 10 per cent under the OAG Phase 1

TABLE 6.3 GRAIN CARRIED BY ROAD AND RAIL TRANSPORT
(thousand tonne-kilometres)

Scenario	*Road transport*	*Rail transport*
Base scenario 1990–91	1 217	3 811
OAG Phase 1	1 193	3 840
OAG Phase 2	1 125	3 935
OAG Phase 1 distance based	1 097	3 954
NSW flat fee	1 209	3 830
NSW distance based	1 129	3 918
Average flat fee	1 232	3 798
Average distance based	1 199	3 826

distance based scenario. This decrease is caused by higher contractor charges under this scenario, which lead to a higher proportion of grain being sent by rail. The largest increase in rail use also occurs under the OAG Phase 1 distance based scenario (the increase is less than 4 per cent).

DISTRIBUTIONAL EFFECTS

In addition to the average impacts of the changes on the costs of transporting grain, estimates of the impact of each scenario at a regional level can be produced with the model. There are 214 of these regions which are based on an aggregation of statistical local areas. The regions are defined in Blyth, Noble and Mayers (1987). Details of the regional distribution of cost changes are presented in tables 6.5 to 6.11 at the end of this chapter. The distributional data are summarised in table 6.4 using the inter-quartile range as a measure of dispersion. If the regions within each State are arranged in order of size of cost change, then the cost change which is exceeded by only 25 per cent of the regions is called the upper quartile while the cost change which is exceeded by 75 per cent of the regions is the lower quartile. The difference between these two costs, the inter-quartile range, is a measure of the scatter of the regional cost changes. This measure is presented for each scenario and State in table 6.4.

The dispersion provides an indication of the degree to which regions are affected differently by the truck charging scenarios. Table 6.4 indicates that regional variations, in absolute terms, would be greater under NSW flat charges than for any other charging scenario. Also, absolute regional variations would tend to be greater in Queensland than in other States.

Another perspective is gained from considering the size of the dispersion in relation to average cost changes. Thus, in New South Wales, the average cost of grain transport and handling (table 6.1), increases by $0.2 per tonne under OAG Phase 1. The difference between the cost increase of the top 25 per cent

TABLE 6.4 CHANGES IN DISPERSION OF TRANSPORT AND HANDLING COSTS FOR GRAIN — INTER-QUARTILE RANGE
($ per tonne)

Scenario	*New South Wales*	*Victoria*	*Queensland*	*South Australia*
OAG Phase 1	0.3	0.2	0.8	0.4
OAG Phase 2	0.3	0.6	0.8	0.7
OAG Phase 1 distance based	0.6	0.5	0.4	0.6
NSW flat fee	1.4	1.1	1.4	0.9
NSW distance based	0.3	0.4	0.6	0.7
Average flat fee	0.6	0.7	1.0	0.6
Average distance based	0.4	0.4	0.3	0.5

of regions and the bottom 25 per cent (table 6.4) was $0.3 per tonne, which is 150 per cent of the average increase. In contrast, in Victoria, under OAG Phase 1, the inter-quartile range ($0.2 per tonne) represents only 25 per cent of the average increase in costs ($0.8 per tonne).

ASSESSMENT OF THE CHANGES

It has been estimated with the Eastern States Grain Transport, Handling and Storage Model that total grain transport costs will increase under almost all of the hypothetical charging scenarios. Except for Victoria, these changes are smallest for the average distance based scenario. The largest cost increases are caused by the adoption of NSW flat rate charges in all States.

The different scenarios have different impacts on grain transport costs in different regions so that in some regions there may be much larger or smaller changes in costs than are suggested by a comparison of State averages. The range of changes between regions also differs both for States and for different scenarios.

The changes estimated for grain transport and handling costs affect the incomes of grain growers. The largest positive impacts on farm cash incomes are under the OAG Phase 1 distance based scenario for wheat and other crops farms in Victoria. The largest negative impact is caused by the adoption of the NSW flat rate scenario in Queensland where farm cash incomes of wheat and other crops farms are reduced by 3.5 per cent.

The overall impact of the scenarios on the whole economy cannot be estimated with a partial equilibrium model such as this, because the benefits of matching road charges to damage costs and hence of improving the allocation of resources in the economy are not taken into account. The estimates presented are an indication of the direct costs of each of the seven scenarios to the grain growing industry in the four eastern States.

APPENDIX — DISTRIBUTIONAL EFFECTS OF SEVEN SCENARIOS OF POSSIBLE CHANGES TO ROAD USER CHARGES

TABLE 6.5 REGIONAL CHANGES IN GRAIN TRANSPORT COSTS FROM IMPLEMENTATION OF OAG PHASE 1 CHARGES
($ per tonne)

State	*New South Wales*	*Victoria*	*Queensland*	*South Australia*
Average cost change	0.19	0.77	1.04	0.74
Upper decile	0.51	0.93	1.91	1.50
Upper quartile	0.39	0.70	1.42	0.99
Median	0.27	0.65	0.81	0.75
Lower quartile	0.09	0.50	0.59	0.55
Lower decile	0.00	0.35	0.35	0.01

TABLE 6.6 REGIONAL CHANGES IN GRAIN TRANSPORT COSTS FROM IMPLEMENTATION OF OAG PHASE 2 CHARGES
($ per tonne)

State	*New South Wales*	*Victoria*	*Queensland*	*South Australia*
Average cost change	0.72	0.21	1.13	0.73
Upper decile	0.82	1.55	2.90	1.44
Upper quartile	0.44	1.22	1.42	1.14
Median	0.27	0.99	0.81	0.76
Lower quartile	0.16	0.65	0.64	0.45
Lower decile	–0.02	0.29	0.36	–0.38

TABLE 6.7 REGIONAL CHANGES IN GRAIN TRANSPORT COSTS FROM IMPLEMENTATION OF OAG PHASE 1 DISTANCE BASED CHARGES
($ per tonne)

State	*New South Wales*	*Victoria*	*Queensland*	*South Australia*
Average cost change	0.50	–0.86	0.32	0.24
Upper decile	0.86	0.92	1.24	0.99
Upper quartile	0.11	0.78	0.42	0.63
Median	–0.28	0.43	0.13	0.28
Lower quartile	–0.51	0.24	0.07	0.00
Lower decile	0.72	–4.37	0.04	–1.03

TABLE 6.8 REGIONAL CHANGES IN GRAIN TRANSPORT COSTS FROM IMPLEMENTATION OF NEW SOUTH WALES FLAT RATE CHARGES
($ per tonne)

State	*New South Wales*	*Victoria*	*Queensland*	*South Australia*
Average cost change	0.78	1.31	2.11	1.53
Upper decile	1.89	4.45	3.54	2.32
Upper quartile	1.47	1.49	2.60	2.00
Median	0.89	1.05	1.66	1.65
Lower quartile	0.09	0.37	1.19	1.10
Lower decile	–0.04	–0.02	0.72	0.47

TABLE 6.9 REGIONAL CHANGES IN GRAIN TRANSPORT COSTS FROM IMPLEMENTATION OF NEW SOUTH WALES DISTANCE BASED CHARGES
($ per tonne)

State	*New South Wales*	*Victoria*	*Queensland*	*South Australia*
Average cost change	–0.15	0.63	0.48	0.41
Upper decile	0.35	0.90	0.96	1.21
Upper quartile	0.03	0.76	0.84	0.85
Median	–0.17	0.39	0.27	0.30
Lower quartile	–0.27	0.32	0.21	0.20
Lower decile	–0.36	0.28	0.16	0.00

TABLE 6.10 REGIONAL CHANGES IN GRAIN TRANSPORT COSTS FROM IMPLEMENTATION OF AVERAGE FLAT RATE CHARGES
($ per tonne)

State	*New South Wales*	*Victoria*	*Queensland*	*South Australia*
Average cost change	0.44	0.72	1.41	1.03
Upper decile	1.10	3.96	2.35	1.38
Upper quartile	0.80	0.97	1.76	1.30
Median	0.51	0.69	1.12	1.08
Lower quartile	0.20	0.26	0.79	0.72
Lower decile	–0.11	–0.15	0.49	0.20

TABLE 6.11 REGIONAL CHANGES IN GRAIN TRANSPORT COSTS FROM IMPLEMENTATION OF WEIGHTED AVERAGE DISTANCE BASED CHARGES

($ per tonne)

State	*New South Wales*	*Victoria*	*Queensland*	*South Australia*
Average cost change	–0.28	0.47	0.19	0.02
Upper decile	0.00	0.66	0.42	0.83
Upper quartile	–0.10	0.63	0.32	0.53
Median	–0.27	0.48	0.09	0.09
Lower quartile	–0.46	0.21	0.07	0.00
Lower decile	–0.52	0.15	0.06	–1.06

CHAPTER 7 CONCLUSION

This chapter provides an overall perspective to the outcomes of the joint BTCE/ABARE study on the implications of road transport (charging) reforms on rural and remote areas. A synopsis of the conduct of the study and some of the more detailed results are provided in the Summary.

The analyses undertaken in the course of this study produced one common result, that there is a great diversity of impacts to be expected from any given change to current road user charges. While it is possible to make some generalisations about the direction and general magnitude of such effects, in many cases there will be important exceptions to such generalisations.

VEHICLE OPERATING COSTS

The impact upon any given heavy vehicle operator of a change in road user charges depends on:

- current charges;
- the level of future charges;
- the charging principles applied (fixed or distance related charges, the availability of rebates against flat fees etc.);
- the nature of vehicle operations (distance travelled, operating costs); and
- competitive circumstances (existence of a rail alternative, nature of the market, overall level of economic activity etc.).

The operation of these principles is reflected in the outcomes of the study. The resulting potential impacts are seen to be as diverse as the circumstances that produce them.

As a general rule, the Overarching Group (OAG) charges would impose more and larger cost increases upon vehicle operators (and their customers) than the introduction of NSW charges, and in turn, more than weighted average State charges. It is possible to find counter examples to this generalisation, so that not all vehicle operators would rank the effects in this order. Distance based schemes tend to operate against the interests of operators in those States and Territories where annual distances travelled are often high. Fixed rate (unrebated) schemes

all States whose annual distance travelled is below average. Whenever annual distances travelled differ appreciably between road users, any flat charge scheme will comparatively disadvantage the lower distance road users, the extent of the disadvantage increasing with the size of the fixed charge.

The results of the study did highlight the substantial inequities that would be caused by the incorporation of concessions limited to road trains under the OAG Phase 1 scheme and early stages of the OAG Phase 2 scheme. Under these schemes, the operators of semitrailers and B-doubles in Queensland, Western Australia, South Australia and New South Wales would experience percentage increases in annual operating cost roughly twice as large as those faced by the operators of road trains.

IMPACT ON FARMERS

The particular circumstances covering the operation of farm vehicles, including their age, their often low utilisation, maintenance and other factors suggest that unrebated fixed rate schemes based on national averages could impact considerably on current vehicle operating costs. Such hypothetical charging schemes could also produce significant impacts relative to annual farm incomes, especially in years when some rural incomes are depressed.

IMPACT ON THE NORTHERN TERRITORY BEEF CATTLE INDUSTRY

The Northern Territory beef cattle industry represents an important case study because existing Northern Territory road user charges are the lowest in Australia by a considerable margin and because the industry is very reliant upon heavy vehicles. Without restating the results in detail, the identifiable effects of altered charges were found to be appreciable, varying greatly with the particular charging scenario involved. In absolute terms, these impacts ranged from about $1700 up to about $10 000, with these amounts representing some 4 per cent to 21 per cent of average net farm cash income in 1990–91. Estimates of farm cash income are volatile due to small sample size.

IMPACT ON GRAIN TRANSPORT COSTS

The grains industry comprises another important case study because it addresses an area which is more rural in character than remote, in contrast with the emphasis elsewhere in this study, and because, to varying degrees, rail exists as an alternative to road transport. One of the significant findings provided by the detail of this study was the variability of impacts across any given State. While average impacts varied between States and between alternative charges, as would be expected, the model shows that variations about such averages can be, (but are not always) large. In such cases a view formed on the basis of average effects can be significantly in error (on either side) when considered from the perspective of particular regions.

SUMMARY

Any move to a uniform system of charges, rebates and administrative procedures can be expected to entail some additional costs to at least some discrete categories of rural and remote area vehicle operators. In addition, the impact of any change to road user charges will be distributed unequally across the States and Territories, unequally between industries, and unequally between individual vehicle operators. The levels of current charges, competitive circumstances and annual distances travelled are the main determinants of those unequal effects.

The study has provided specific estimates of the diverse impacts to be expected from a range of conceivable, theoretical changes to road user charges. Such impacts need to be taken into account in formulating any national system of heavy vehicle charges but they do not, of themselves, indicate preferred charges. To arrive at the latter, the economic benefits of changes need to be evaluated in the context of the associated adjustment and other costs. There are also substantial issues of administrative feasibility and enforcement to be taken into account.

As the process of formulating desirable reforms to road transport continues, the analytical framework developed in this study can be employed to cast some light on the manner and degree to which any specific charging reform might affect those dependent on heavy vehicle operations in rural and remote Australia.

APPENDIX I ROAD USER CHARGE SCENARIOS

At the time this study was undertaken the National Road Transport Commission was still considering its recommendations regarding road user charges. To ensure the relevance of the study to public debate and to the Commission's work, it was decided to provide estimates of the impacts of a range of charging options. Seven charging scenarios were examined:

OAG Phase 1 *(flat fee)*
OAG Phase 1 *(distance based)*
OAG Phase 2 *(essentially distance based)*
Weighted average of State charges *(flat fee)*
Weighted average of State charges *(distance based)*
NSW charges *(flat fee)*
NSW charges *(distance based)*

The first three charging scenarios were derived from work done by the Commonwealth–State Overarching Group on Land Transport and partially published in Overarching Group (1991). These charges are shown in table I.1. The remaining four scenarios were based on the weighted average of all State (and Territory) charges and New South Wales charges as at 1 January 1991. These are shown in table I.2. Note that no rebates or concessions were taken into account in any of the charging scenarios.

Overarching Group charges

A considerable body of work underlies the determination of the first three charges, which have their origins in the often considerably higher charges recommended by the Inter-State Commission (1990). The OAG charges have been considered to represent an upper bound to any revised charges that may emerge from the processes of road transport reform.

The first scenario is based on charges proposed by Overarching Group (1991) for the initial stage of its two-phase scheme. Under this scheme a flat fee would be applied, which is designed to fully recover road costs for each vehicle class, based on average distances travelled by that class.

A variant of the first scenario, called OAG Phase 1 *(distance based)*, was constructed which charged on the basis of actual distance travelled (rather than

TABLE I.1 CHARGING SCENARIOS BASED ON OVERARCHING GROUP REPORT

	OAG Phase 1			*OAG Phase 2*		
		Distance based			*Distance based*[b]	
	Flat fee ($)	*Access ($)*	*Distance charge ($/km)*	*Flat fee*[a] *($)*	*Access ($)*	*Distance charge (S/km)*
Rigid trucks						
2-axle						
2.7 to 3.5 tonne	184	184	0	250	250	0
3.5 to 4.5 tonne	250	250	0	250	250	0
4.5 to 7.0 tonne	250	250	0	250	250	0
7.0 to 12.0 tonne	250	250	0	250	250	0
Over 12.0 tonne	650	250	0.018	250	250	0
3-axle						
12.0 to 18.0 tonne	500	250	0.008	500	na	na
Over 18.0 tonne	1 500	250	0.042	500	na	na
4-axle						
Up to 25.0 tonne	500	250	na	na	na	na
Over 25.0 tonne	2 250	250	na	na	na	na
5-axle or more	9 500	250	0.185	10 550	250	0.064
Semitrailers						
3-axle	1 350	250	0.012	na	na	na
4-axle	5 750	250	0.059	na	na	na
5-axle	9 500	250	0.098	na	na	na
6-axle	7 750	250	0.080	14 400	250	0.088
B-double	12 370	250	0.129	24 350	250	0.151
Road train (double)	7 575	250	0.078	30 400	250	0.188
Road train (triple)	11 250	250	0.117	46 400	250	0.288

na Not available

a. Applies only to vehicles which travel distances more than the 85th percentile distances specified in Overarching Group (1991).

b. Applies only to vehicles which travel distances less than the 85th percentile distances specified in Overarching Group (1991).

average distance travelled). The distance based charges were derived by subtracting an access charge of $250 from the flat fee and then dividing the remainder by the relevant average distance shown in table I.3. The result is a charge with two components, consisting of a $250 charge for access to the public road system and an additional distance charge per kilometre. For example, the fee for a 5-axle semitrailer is $250 plus $0.098 per kilometre. The latter fee was derived by subtracting $250 from the flat 1 fee of $9 500 and then dividing the balance by 94 000 kilometres. It can be shown mathematically that the distance based variant of the OAG Phase 1 charge raises the same total revenue (per vehicle class) as its flat fee counterpart.

OAG Phase 1 (distance based) and the other distance related scenarios are theoretical constructs intended to illustrate the effects of pure distance related

TABLE I.2 CHARGING SCENARIOS BASED ON STATE FEES[a]

	Weighted average of State charges		*NSW charges*	
	Flat fee ($)	*Distance based ($/km)*	*Flat fee ($)*	*Distance based ($/km)*
Rigid				
2-axle				
2.7 to 3.5 tonne	184	0.0083	220	0.0100
3.5 to 4.5 tonne	257	0.0116	333	0.0151
4.5 to 7.0 tonne	377	0.0171	567	0.0257
7.0 to 12.0 tonne	712	0.0322	1 018	0.0461
Over 12.0 tonne	1 282	0.0580	1 726	0.0781
3-axle				
12.0 to 18.0 tonne	1 376	0.0459	1 851	0.0617
Over 18.0 tonne	2 033	0.0678	2 823	0.0941
4-axle				
Up to 25.0 tonne	1 423	na	1 839	na
Over 25.0 tonne	2 461	na	3 473	na
5-axle or more	2 315	0.0463	4 196	0.0839
Semitrailers				
3-axle	1 772	0.0189	2 611	0.0278
4-axle	2 528	0.0269	3 923	0.0417
5-axle	3 426	0.0364	5 371	0.0571
6-axle	4 521	0.0481	6 794	0.0723
B-double	7 605	0.0809	12 848	0.1367
Road train (double)	na	na	6 751	0.0718
Road train (triple)	4 231	0.0450	na	na

na Not available

a. As at 1 January 1991.

TABLE I.3 DISTANCES USED TO DERIVE DISTANCE BASED CHARGES

(kilometres)

	Average	*85th percentile*
Rigid trucks		
2-axle	22 100	na
3-axle	30 000	na
5-axle or more	50 000	160 000
Articulated vehicles[a]	94 000	160 000

na Not available

a. This category includes semitrailers, B-doubles and road trains.

Source Overarching Group (1991).

charging systems based on a given level of cost recovery. The practical implementation of any distance based scheme is, of course, another matter and would require the solution of significant administrative, compliance and enforcement problems.

The third scenario, OAG Phase 2, is derived from charges proposed by Overarching Group (1991) for the second stage of its scheme. Under this scheme a flat fee based on vehicles travelling the 85th percentile distance would be levied on all road users. However, if a vehicle travels less than the 85th percentile distance then the owner would be eligible for a rebate.

To approximate this scheme it was decided to apply a distance related fee for vehicles travelling below 85th percentile distances and a flat fee otherwise. The distance related fee was derived in a similar manner to that for OAG Phase 1 (distance based). An access charge of $250 was subtracted from the flat fee and then divided by the relevant 85th percentile distance shown in table I.3. For example, the fee for a 6-axle semitrailer is $250 plus $0.088 per kilometre. The latter fee was derived by subtracting $250 from the flat fee of $14 400 and then dividing it by 160 000 kilometres.

Since road users travelling in excess of the 85th percentile distance are not charged more than the fixed fee attributable to that distance, it follows that the rebate system to operate below the 85th percentile distance will have to over-recover costs by the amount of shortfall from high distance road users. To this extent, the distance related estimates of OAG Phase 2 charges used in this scenario will underestimate the charges that would be applied to vehicles travelling less than the 85th percentile distance under the OAG Phase 2 scheme.

Weighted average of State and Territory charges

These charges, in both flat and distance based forms, were chosen to represent a lower bound to any revised charges that might result from current proposals for road transport reforms. The introduction of weighted average charges nationally would eliminate the inefficiencies associated with nine different levels of widely varying charges but would not, of itself, fully recover road costs as estimated by Overarching Group or Inter-State Commission methodologies.

The resulting charges shown in table I.2 do not include compulsory third-party insurance, which in all cases is assumed to remain unaffected by any new road user charges. The distance based charges were derived by the method previously described, that is, by dividing the corresponding flat fee by the average distances in table I.3.

NSW charges

These charges generally represent the highest charges currently levied by any State or Territory, but are still less than the OAG charges. They were seen as providing an intermediate yardstick compared to the other scenarios.

Again, as previously described, the distance based variant was derived by dividing the corresponding flat fee by the average distances in table I.3.

Existing registration charges

The impacts of the seven scenarios were examined in terms of the difference between each scenario and the relevant existing (that is, January 1991) State or Territory registration charge. These charges are set out in table I.4 and are as supplied by the Department of Transport and Communications. A representative selection of these charges is shown in figure I.1 and illustrates the substantial differences that exist between some States and Territories. Note that the fees shown in table I.4 and figure I.1 should be regarded as indicative, not exact, because of the different bases upon which current charges are levied.

As a result of the differences between existing State and Territory charges, it is to be expected that the impacts of any one of the scenarios detailed here will differ markedly across Australia.

TABLE I.4 STATE AND TERRITORY REGISTRATION CHARGES AT 1 JANUARY 1991
($)

Vehicle type	*NSW*	*Vic.*	*Qld*	*SA*	*WA*	*Tas.*	*NT*	*ACT*	*Weighted current*
Light commercial	220	154	133	120	93	98	78	282	157
Rigid									
2-axle									
2.7 to 3.5 tonne	220	148	206	120	89	97	62	282	184
3.5 to 4.5 tonne	333	195	325	197	154	230	128	402	257
4.5 to 7.0 tonne	567	223	415	270	177	266	112	582	377
7.0 to 12.0 tonne	1 018	636	775	425	368	370	252	910	712
Over 12.0 tonne	1 726	1 115	1 135	858	1 159	503	252	1 446	1 282
3-axle									
12.0 to 18.0 tonne	1 851	1 166	1 495	1 170	1 456	580	476	1 848	1 376
Over 18.0 tonne	2 823	1 823	1 855	1 326	1 614	756	510	2 183	2 033
4-axle									
Up to 25.0 tonne	1 839	826	2 125	1 482	1 271	848	352	1 896	1 423
Over 25.0 tonne	3 473	1 961	2 395	1 482	1 810	951	510	2 518	2 461
5-axle or more	4 196	2 102	2 537	1 420	2 173	1 250	498	3 660	2 315
Articulated trucks									
3-axle	2 611	1 459	2 009	1 417	1 385	831	365	2 363	1 772
4-axle	3 923	1 904	2 240	2 035	1 771	1 173	567	3 124	2 528
5-axle	5 371	3 652	2 504	2 360	2 296	1 250	689	3 619	3 426
6-axle	6 794	3 863	3 260	2 684	2 517	1 325	510	4 233	4 521
B-double	12 848	13 113	3 884	3 864	2 741	na	893	6 111	7 605
Road train[a]	6 751	na	5 520	6 458	4 356	na	1 579	na	4 231

na Not applicable

a. NSW figure applies to a double road train, all other figures apply to triple road trains.

Source Land Transport Policy Division, Department of Transport and Communications.

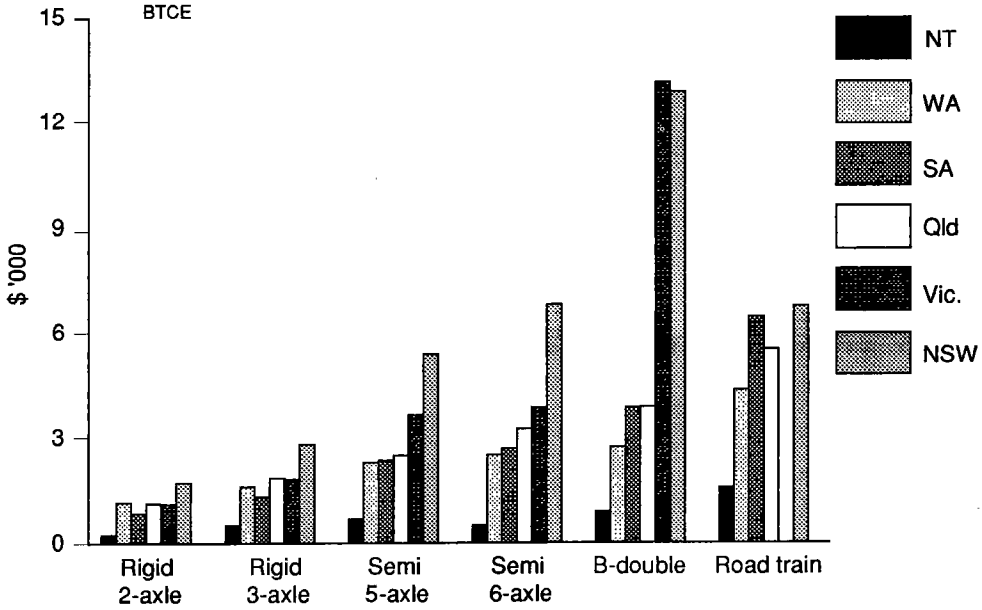


Figure I.1 Existing State registration charges in six States for a range of vehicles

APPENDIX II AUSTWAY COMMERCIAL ROAD TRANSPORT COSTING SYSTEM

This study employed the Austway Commercial Road Transport Costing System, designed by Austway Consultants Pty Ltd, to estimate truck operating costs. This model was selected because it provides independent estimates of truck operating costs and because it has withstood the scrutiny of commercial transport operators over several years.

The model is claimed to produce estimates that vary within plus or minus 2.25 per cent of calculations undertaken by independent authorities.

Austway calculates financial vehicle operating costs rather than economic vehicle operating costs. As such, the model uses actual market prices, without adjustment for taxes such as sales tax on new vehicles or parts or taxes on fuel. This suits the present study which sought to calculate and analyse the financial impact of the altered road user charges on vehicle operators without theoretical adjustments for transfer payments.

As with any model, Austway relies upon accurate input data, and to this end it is regularly updated to incorporate current charges. For many of the inputs required, default settings are provided and are set at levels that reflect reasonable industry standards. If the defaults are not applicable in specific cases they may be replaced by more appropriate or known costs.

A number of the Austway defaults were used in the study partly to minimise the burden on those surveyed and partly because the aim of the study was to develop indicative costs for routes rather than specific costs for individual operators. In this way, cost differences between routes could be ascribed more to route specific factors, rather than the characteristics of individual operators, such as (for example), the operator's detailed financial arrangements or insurance particulars.

Figure II.1 presents a flow chart outline of the Austway model. As shown, the first input is the vehicle type: there are eight options for choice of vehicle ranging from rigid trucks through to triple road trains. The second input is the axle combination of the vehicle type. This permits selection of the number of steer axles, drive axles, trailer axles and dolly axles as applicable. Next, truck body type is entered, for example, flat top, refrigerated, stockcrate and so on.

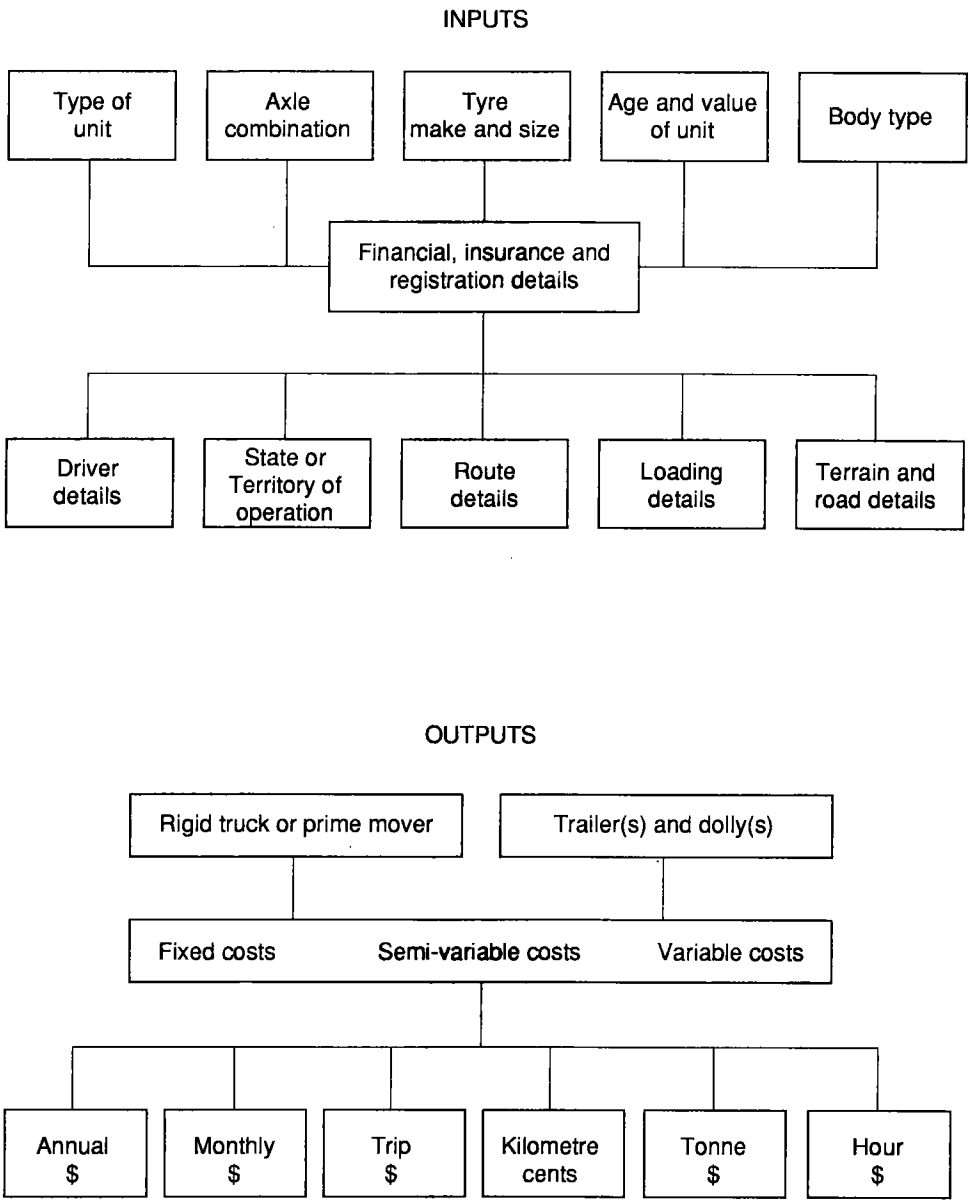


Figure II.1 Flow chart of Austway road transport costing model

The next part of the model focuses on the specific details of the individual truck. This involves providing data on the age and the value of the unit, on the size and make of the tyres used by the vehicle and the use of retreads. Default values are provided in the model for unit value, and for size and make of tyres used.

Financial, insurance and registration details are an important component of the Austway model and can be updated six-monthly by purchasing the revised

software. 'Financial details' refers to the method of vehicle acquisition and includes provision for leasing, hire purchase and ownership. Default settings are available for these variables as well as for the costs of comprehensive insurance, registration and compulsory third-party insurance. These values may be altered, if required, to allow for concessions or rebates.

Data relating to the use of the vehicle is the next input. This requires driver details, State(s) and/or Territory of operation, route details, loading details, and terrain and road details.

'Driver details' refers to the number of drivers employed, driver overheads, award rates or other methods of payment, the time taken to complete each journey, the number of round trips per week, the days of operation and the number of weeks of operation per year. 'Route details' refers to the origin and destination of the journey and the trip distance. 'Loading details' refers to the amount and type of freight carried and the amount of time involved in loading and unloading the vehicle. 'Terrain and road details' refers to the nature of the terrain encountered on the route and the type and quality of road. Default settings are not provided for these details as all are operation-specific.

With these and other minor details complete the model can be run to generate vehicle operating costs. As figure II.1 shows, output data are provided in a number of categories. Firstly, the costs relating to the rigid truck or prime mover are distinguished from the costs relating to any trailers and dollys being towed. Secondly, a distinction is drawn between fixed costs, semi-variable costs and variable costs. Thirdly, the output is presented in six forms:

Annual costs ($)
Monthly costs ($)
Costs per trip ($)
Costs per kilometre (c)
Costs per tonne ($)
Costs per hour ($)

Because the hypothetical road user charges examined in this study were stated in annual terms, the focus of this analysis was based on annual operating costs derived from incorporating details applicable to representative individual trips undertaken during the course of a full year.

APPENDIX III COMMENTS FROM ROAD TRANSPORT OPERATORS

In obtaining the data required to undertake this study, discussions by phone were held with some sixty road transport operators serving rural and remote areas in the Northern Territory, Western Australia, South Australia, Queensland, Tasmania and New South Wales. The BTCE gratefully acknowledges the extremely high level of cooperation given by these operators in providing the information sought.

During the course of this process, a number of operators took the opportunity to express views and concerns they held regarding the issue of road charging reforms. The BTCE considers that these views and concerns should not stop with the BTCE researchers to whom they were communicated, but should be placed on record.

The following paragraphs summarise the opinions expressed in essentially the operators' own words. They may be taken to be a good reflection of the 'grass roots' opinions most strongly held by rural and remote area road transport operators.

Impact on the road transport industry

The major concern expressed was that the charges would send lots of operators broke. It was emphasised that there was virtually no slack in the transport business. There was a general concern that governments did not understand the absence of profits to be made out of road transport. Indeed, many operators found operating margins so tight that they could not afford the time or the money to protest the proposed charges. Given the current recession, and especially the rural recession (for which many examples were given), passing on any additional costs was thought to be virtually impossible. This lack of profit has also curtailed investment in new trucks or other equipment. One suggestion made was that concessions and investment allowances, rather than higher charges, were required to stimulate investment and to create jobs.

Charging levels

Many operators felt that the amount of money currently raised from the road transport industry is more than adequate, but that the government is putting

money into general revenue rather than into roads. Some operators were worried that the mass–distance charge could end up like the fuel tax, which is used to contribute to general revenue, and as such is viewed as nothing more than a revenue raising exercise. Concern was also expressed about the collection system, with honesty sytems disadvantaging honest operators, and other systems (like the OAG charges) seen as potentially disadvantaging low mileage operators. Fuel tax was seen as being the best source of additional revenue, rather than a separate mass–distance charge, because collection is administratively easy, and avoidance is difficult.

Some operators thought that these charges will only add to the paperwork involved in running a truck, and that there were already too many rules and regulations. On a number of occasions it was said that there was too much hassle involved in operating a truck.

Some felt that higher charges could not be justified on dirt surfaces, but could possibly be justified on asphalt surfaces. Some felt that road revenue was being misallocated by being used for repairing roads when rebuilding the road would be better.

Distributional impact

Almost all operators were keen to emphasise that rural and remote areas are different. These areas were noted as being very reliant on road transport, especially now that rail is little used for intrastate transport of anything other than bulk commodities. High freight costs make rural and remote areas more expensive to live in. Distance was regarded as making the difference, something that eastern seaboard companies and governments did not understand. Lower road quality compared with the eastern seaboard was also regarded as adding to freight charges, mainly through higher repairs and maintenance costs. The variability of traffic from year to year was also mentioned. One particular concern emphasised was that fuel, an essential input, would become more expensive as a result of these charges.

Road transport competitors

External competition against the full-time commercial road transport industry was heavily criticised. Subsidised sea and rail competition was thought to be unfair, especially with moves towards the implementation of full cost recovery for roads. Cross-subsidisation within the rail network was also criticised, with profits from the transport of commodities such as coal being used to subsidise the losses on the transport of freight to and from rural areas. Farmers operating their own trucks provide competition for the transport of farm equipment and produce. These farmers were the subject of criticism from some operators for having an unfair competitive advantage, as they currently pay lower registration charges, are getting bigger trucks, and are regarded as avoiding paying diesel excise.

APPENDIX IV IMPACT OF THE JUNE 1992 NRTC HEAVY VEHICLE CHARGES DETERMINATION

Coinciding with the final stages of the publication process for this report was the release of the June 1992 NRTC *Heavy Vehicle Charges Determination*. These charges have been substituted for the seven hypothetical charges addressed throughout the report and the results are presented in this appendix. Not repeated, however, is the full breadth of background, descriptive and explanatory comment that should be understood when interpreting these estimates. Similarly, an appreciation of the qualifications and limitations applying to the figures is best obtained from the relevant chapters of the report proper.

Methodology

The study employed the following sources of data and techniques:

- advice and information from each of the relevant Northern Territory, Western Australia, South Australia, Queensland, Tasmania and New South Wales departments of transport. This material related to the selection of representative rural and remote area routes, traffic data and lists of operators that should be approached for assistance;
- data obtained from heavy vehicle operators serving selected rural and remote routes in each of the above States and Territory;
- an independent commercial truck costing model (Austway);
- statistics collected by ABARE on behalf of the Queensland Department of Transport, relating to the type and use of farm vehicles;
- the ABARE Agricultural and Grazing Industries Survey and a special supplementary survey of Northern Territory beef cattle producers; and
- an ABARE model of grain distribution in eastern Australia, updated to 1990–91 road, rail and port costs.

Comparison of NRTC charges with those addressed elsewhere in the report

The NRTC has recommended annual fixed charges, incorporating both an access charge and a mass–distance charge. This charge would replace existing State and Territory registration charges.

TABLE IV.1 FIXED RATE CHARGES UNDER VARIOUS SCENARIOS
($)

	OAG Phase 1	*NSW charges*	*Weighted average of State charges*	*NRTC charges*
Rigid trucks				
2-axle				
4.5 to 7.0 tonnes	250	567	377	300
7.0 to 12.0 tonnes	250	1 018	712	300
over 12.0 tonnes	650	1 726	1 282	500
3-axle				
12.0 to 18.0 tonnes	500	1 851	1 376	600
over 18.0 tonnes	1 500	2 823	2 033	800
4-axle				
up to 25.0 tonnes	500	1 839	1 423	900
over 25.0 tonnes	2 250	3 473	2 461	2 000
5-axle or more	9 500	4 196	2 315	2 600
Semitrailers				
3-axle	1 350	2 611	1 772	1 050
4-axle	5 750	3 923	2 528	1 300
5-axle	9 500	5 371	3 426	3 750
6-axle	7 750	6 794	4 521	4 000
B-double	12 370	12 848	7 605	5 500
Road train (double)	7 575	6 751	na	6 750
Road train (triple)	11 250	na	4 231	8 500

na Not available

Table IV.1 sets out the fixed charges analysed in the report (OAG Phase 1, NSW and weighted average) together with the June 1992 NRTC charges for the vehicle categories studied.

While noting that the costings in the study generally represent those applying to 1990–91, and that the NRTC charges are expressed in 1992–93 price levels, the following generalisation can be made:

> With one exception, NRTC charges are broadly similar to, or less than, the weighted average of State and Territory registration charges. Consequently, the impacts of the NRTC recommendations would be similar to, or less than, the impacts of the weighted average charges as identified in the report. The exception applies to triple road trains, for which impacts would be less than those calculated for the OAG Phase 1 charging option.

Impact on vehicle operating costs in rural and remote Australia

The BTCE/ABARE study sought to identify representative instances of the full-time commercial use of heavy vehicles across rural and remote Australia. Vehicle operators in the Northern Territory, Queensland, Western Australia, South Australia, New South Wales and Tasmania were surveyed and estimates developed of typical operating conditions and costs. The changes in vehicle operating costs associated

with the implementation of the June 1992 NRTC charges were then calculated in both dollar and percentage terms. The dollar change shows the immediate impact as faced by the vehicle operator, while the percentage change provides an indication of the extent to which the freight component of the price of goods carried by such vehicles could be affected by the NRTC charges.

Table IV.2 summarises the range of impacts to be expected in each of the above-mentioned States and the Northern Territory. The table identifies the vehicle type that would be least affected, and the vehicle type that would be most affected, in percentage terms, by the NRTC charges. The table also provides details of the corresponding changes in vehicle operating costs in dollar terms.

Under the NRTC charges, representative rural and remote area heavy vehicle operating costs would rise by between 1.4 and 2.9 per cent in Tasmania and the Northern Territory, and would rise by between 0.2 and 1.1 per cent in Queensland, South Australia and Western Australia. Representative rural and remote area heavy vehicle operating costs would fall by up to 1.3 per cent in New South Wales.

Tables IV.3 to IV.8 provide additional details of the dollar and percentage changes in vehicle operating costs associated with the NRTC charges, for each of the vehicle types and each State and Territory covered in the study.

TABLE IV.2 CHANGES IN VEHICLE OPERATING COSTS DUE TO NRTC CHARGES — AUSTRALIA

	Change in vehicle operating cost	
State and vehicles	*Per cent*	*$*
Northern Territory		
Triple road train tanker	1.4	7 062
Double road train pantechnicon	2.9	5 606
Queensland		
6-axle refrigerated semitrailer	0.3	740
Double road train stockcrate	0.6	1 557
Western Australia		
6-axle flat top semitrailer	0.7	1 483
Flat top double road train	1.1	3 051
South Australia		
Flat top double road train	0.2	577
6-axle semitrailer tipper	0.7	1 316
New South Wales		
3-axle 12-tonne flat top rigid	–1.3	–1 251
Flat top double road train	0.0	–1
Tasmania		
3-axle rigid tipper/2-axle pig	1.4	1 350
6-axle flat top semitrailer	2.5	2 675

TABLE IV.3 CHANGES IN VEHICLE OPERATING COSTS DUE TO NRTC CHARGES — NORTHERN TERRITORY

Route and vehicles	*Change in vehicle operating cost*	
	Per cent	*$*
Stuart Highway		
Alice Springs–Darwin		
Refrigerated triple road train	1.4	7 062
Triple road train pantechnicon	1.5	7 062
Triple road train tanker	1.4	7 062
Flat top triple road train	1.6	7 062
Darwin–Katherine		
Double road train pantechnicon	2.9	5 606
Other routes		
Triple road train stockcrate	2.0	7 062
Tanami Road		
Triple road train tanker	2.4	7 062

TABLE IV.4 CHANGES IN VEHICLE OPERATING COSTS DUE TO NRTC CHARGES — QUEENSLAND

Routes and vehicles	*Change in vehicle operating cost*	
	Per cent	*$*
Warrego/Landsborough/Barkly Highways		
Brisbane–Mount Isa		
6-axle refrigerated semitrailer	0.3	740
Flat top double road train	0.6	1 557
Refrigerated double road train	0.6	1 557
Warrego Highway/Diamantina Developmental Road		
Brisbane–Windorah		
6-axle flat top semitrailer	0.4	740
6-axle semitrailer tipper	0.4	740
6-axle semitrailer stockcrate	0.4	740
Refrigerated B-double	0.6	1 616
Double road train stockcrate	0.6	1 557
Double road train tanker	0.6	1 557

TABLE IV.5 CHANGES IN VEHICLE OPERATING COSTS DUE TO NRTC CHARGES — WESTERN AUSTRALIA

	Change in vehicle operating cost	
Routes and vehicles	*Per cent*	*$*
North West Coastal Highway		
Perth–Port Hedland		
6-axle flat top semitrailer	0.7	1 483
6-axle semitrailer pantechnicon	0.8	1 483
Flat top double road train	1.1	3 051
Refrigerated double road train	0.7	3 051
Double road train pantechnicon	0.8	3 051
Double road train tanker	0.9	3 051
Triple road train tipper	0.9	4 144
Triple road train pantechnicon	0.9	4 144
Flat top triple road train	0.9	4 144
Refrigerated triple road train	0.8	4 144

TABLE IV.6 CHANGES IN VEHICLE OPERATING COSTS DUE TO NRTC CHARGES — SOUTH AUSTRALIA

	Change in vehicle operating cost	
Routes and vehicles	*Per cent*	*$*
Eyre Peninsula		
6-axle flat top semitrailer	0.7	1 316
6-axle semitrailer tipper	0.7	1 316
6-axle semitrailer stockcrate	0.5	1 316
6-axle refrigerated semitrailer	0.5	1 316
6-axle pantechnicon semitrailer	0.5	1 316
Flat top B-double	0.6	1 636
Double road train tipper	0.3	577
Flat top double road train	0.2	577
Stuart Highway		
5-axle flat top semitrailer	0.5	1 390
6-axle flat top semitrailer	0.5	1 316

TABLE IV.7 CHANGES IN VEHICLE OPERATING COSTS DUE TO NRTC CHARGES — NEW SOUTH WALES

	Change in vehicle operating cost	
Routes and vehicles	*Per cent*	*$*
Mitchell Highway		
Far north-west New South Wales		
2-axle 8-tonne rigid pantechnicon	–0.7	–718
2-axle 8-tonne flat top rigid	–1.0	–718
3-axle 12-tonne flat top rigid	–1.3	–1 251
6-axle flat top semitrailer	–1.2	–2 794
6-axle semitrailer stockcrate	–1.3	–2 794
Flat top double road train	0.0	–1
Double road train tipper	0.0	–1
Double road train stockcrate	0.0	–1

TABLE IV.8 CHANGES IN VEHICLE OPERATING COSTS DUE TO NRTC CHARGES — TASMANIA

	Change in vehicle operating cost	
Routes and vehicles	*Per cent*	*$*
Murchison Highway		
Burnie–Queenstown		
3-axle rigid tipper/2-axle pig	1.4	1 350
5-axle semitrailer tipper	2.3	2 500
6-axle semitrailer tipper	1.9	2 675
6-axle flat top semitrailer	2.5	2 675
6-axle semitrailer tanker	1.5	2 675

Impact on Queensland broadacre farms

The data presented in this section are based upon an ABARE survey commissioned by the Queensland Department of Transport. Survey results were analysed at both the State level and by three geographic zones defined by the principal land use, namely pastoral, wheat–sheep and high rainfall.

The survey of farm vehicle ownership and use found five representative farm vehicle types. The percentage increases in vehicle operating costs that would occur in each zone under NRTC charges are shown in table IV.9.

The potential increases would vary from about 5 per cent for some rigid farm trucks to about 40 per cent for some articulated farm trucks. The increases are all relatively large in percentage terms compared to the impacts on full-time commercial heavy

vehicle operators, for three main reasons. First, the NRTC charges are fixed charges calculated, in part, on the basis of national average annual distances travelled, which are larger than those undertaken by Queensland farmers. Second, the NRTC charges do not incorporate any rebates or concessions for primary producers, unlike the 1991 Queensland charges. Third, farm trucks are typically older models travelling relatively small distances annually. Consequently their annual operating costs tend to be relatively low and the impact of a given fixed increase in charges is correspondingly larger.

Table IV.10 sets out the potential direct impact of the NRTC charges on Queensland broadacre industry costs in dollars and expressed as a percentage of average farm cash incomes. At the all zones level, broadacre industry costs in 1990–91 would have been increased by about $5.4 million with the implementation of the NRTC charges. Second-round or indirect effects are not included in this estimate. Most of the increase in costs would occur in the wheat–sheep zone because the majority of farm trucks were in that region. The increase in costs at the all zones level would have represented a decrease of about 1.1 per cent in average farm cash incomes in 1990–91. The impacts on individual farms could depart appreciably from the zone

TABLE IV.9 PERCENTAGE CHANGE IN VEHICLE OPERATING COSTS DUE TO NRTC CHARGES — QUEENSLAND BROADACRE FARMS
(per cent)

Zone	*2-axle rigid*	*3-axle rigid*	*4-axle semi*	*5-axle semi*	*6-axle semi*
Pastoral	5.6	5.3	na	40.5	34.0
Wheat–sheep	9.2	6.9	na	35.2	29.8
High–rainfall	4.9	4.1	na	33.4	28.3
All	7.0	5.7	8.7	35.2	29.7

na Not available

TABLE IV.10 CHANGES IN BROADACRE INDUSTRY 1990–91 COSTS AND FARM CASH INCOME DUE TO NRTC CHARGES

Zone	*Impact on industry costs ($m)*	*Impact on average farm cash income (per cent)*
Pastoral zone	0.7	–0.4
Wheat–sheep zone	3.5	–1.5
High–rainfall zone	1.3	–1.0
All zones	5.4	–1.1

averages, depending on the specifics of vehicle operation and on farm incomes. The impacts on all farms could also vary markedly from year to year depending on seasonal conditions and commodity prices.

Impacts on the Northern Territory beef cattle industry

The Northern Territory beef cattle industry is heavily dependent on road transport, with large distances to be travelled. Any changes to road user charges would impact on the cost of operating cattle producers' own trucks, the costs of commercial cartage of cattle, the prices received for cattle sold on farm ('paddock sales'), prices received for other methods of sale and the cost of farm inputs transported by road. Estimates of the effects of the latter two components could not be made due to data limitations, but they could be considered to be relatively small. Based on the pattern of cattle movements in the Northern Territory in the 1990–91 season, ABARE have estimated that farm cash income in the Territory would have been reduced by $2473 or about 5 per cent if the NRTC charges were to replace actual 1990–91 arrangements. The ABARE estimate has a relative standard error of 27 per cent and provides a broad benchmark only. It does not include second-round effects or impacts on farm input costs.

Impact on the eastern States grain industry

The eastern States grain storage, handling and transport model is a linear programming model which identifies the least-cost path for grain from the farm to domestic and foreign destinations, throughout the eastern States of Australia (Queensland, New South Wales, Victoria and South Australia). All costs used in the model were updated, with those for a representative 3-axle rigid farm truck and a 6-axle articulated contractor truck being based upon the NRTC charges.

The induced changes in average grain transport and handling costs per tonne, along with the base average cost, in each State are set out in table IV.11. Transport and handling costs would decrease by 30 cents per tonne in New South Wales, but would increase by between 5 and 51 cents in the other three States.

Estimates of the impact on average farm cash income of NRTC charges for changes in transport and handling charges are set out in table IV.12. The effects on the wheat and other crops industry would range from an increase in farm cash income in New South Wales of 0.6 per cent to a decrease of 0.8 per cent in Victoria. For the

TABLE IV.11 CHANGES IN AVERAGE 1990–91 TRANSPORT AND HANDLING COSTS FOR GRAIN DUE TO NRTC CHARGES

($ per tonne)

	NSW	*Vic.*	*Qld*	*SA*
NRTC charges	–0.30	0.51	0.30	0.05
Base average cost	50.90	49.59	56.55	41.29

TABLE IV.12 IMPACT OF NRTC CHARGES ON FARM CASH INCOME OF GRAIN GROWING FARMS

	Wheat and other crops industry		*Mixed livestock–crops industry*	
State	*Average farm cash income*[a] *($ per farm)*	*Change in farm cash income (per cent)*	*Average farm cash income*[a] *($ per farm)*	*Change in farm cash income (per cent)*
New South Wales	52 424	0.6	37 030	0.3
Victoria	32 454	–0.8	33 638	–0.5
Queensland	34 977	–0.5	26 506	–0.4
South Australia	38 594	–0.1	33 112	–0.1

a. Average 1986–87 to 1990–91 (in 1990–91 prices).

mixed livestock–crops industry the effects would range from an increase of 0.3 per cent in New South Wales to a decrease of 0.5 per cent in Victoria. (The effects in South Australia and Queensland would be a decrease in farm cash incomes for both industries of about 0.1 and 0.5 per cent respectively.) These estimates are averages and do not apply to all regions within a State or to all farms within a region.

Summary

The June 1992 NRTC recommended charges would produce increases in vehicle operating costs in most rural and remote areas, except those in New South Wales. Any increases would generally be smaller than those associated with other proposals that have been advanced for uniform charges, such as the adoption of average State and Territory charges, the adoption of New South Wales charges nationally, the introduction of the Overarching Group recommended charges or the introduction of the Interstate Commission recommended charges.

In a majority of States, increases in vehicle operating costs in rural and remote areas under the June 1992 NRTC charges would be less than 1 per cent; in the other cases increases would be less than 3 per cent. Impacts on incomes can be greater than these proportions and, in the case of Northern Territory beef cattle enterprises, the potential impact of the NRTC charges was estimated to represent a decrease of about 5 per cent in 1990–91 income levels.

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Abbreviations

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AGPS Australian Government Publishing Service

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ABBREVIATIONS

AADT	Annual average daily traffic
AAGIS	Australian Agricultural and Grazing Industry Survey
ABARE	Australian Bureau of Agricultural and Resource Economics
B-double	Double articulated trailer road vehicle
BTCE	Bureau of Transport and Communications Economics
CALM	Computer Aided Livestock Marketing System
Culway	An automated weigh-in-motion traffic monitoring system
NRTC	National Road Transport Commission
NSW	New South Wales
OAG	Commonwealth–State Overarching Group on Land Transport
SMVU	*Survey of Motor Vehicle Usage*