Cost Recovery in Australian Transport 1974/75

Report

In recent years, increasing attention has been focussed on the question of charges for services provided by governments. In particular, the Commonwealth Government's 'cost recovery' policies have been the subject of wide debate, especially in their application to air transport. This Report contains results of a study of cost recovery in Australian transport generally in the year 1974-75. Each major mode of transport is included, and the analysis is comprehensive in the sense that different areas and classes of transport operations within each mode are analysed wherever applicable or practicable.

BUREAU OF TRANSPORT ECONOMICS

COST RECOVERY IN AUSTRALIAN TRANSPORT 1974-75

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FOREWORD

In recent years, increasing attention has been focussed on the question of charges for services provided by governments. In particular, the Commonwealth Government's 'cost recovery' policies have been the subject of wide debate, especially in their application to air transport. This Report contains results of a study of cost recovery in Australian transport generally in the year 1974-75. The study was referred to the BTE by the Minister for Transport (the Honourable P.J. Nixon, M.P.,) and covers financial aspects of cost recovery in various areas and classes of operation for all modes of transport.

The Report was prepared by the Transport Resources Investigation Branch of the BTE, under the direction of Mr W.P. Egan. The study was carried out by Dr N.J. Steeper and Mr W.N. Aplin, with assistance from various members of the staff of the Branch. Valuable contributions to the economic theory of cost recovery in Chapter 3 and other parts of the report were made by Mr A.J. Shaw and other officers of the Economic Evaluation Branch.

I would like to acknowledge the assistance provided by many organisations in the course of this study. In particular, the assistance rendered by the Australian Stevedoring Industry Authority is appreciated. The BTE is also indebted to the many officers of the Commonwealth Department of Transport who made available their in-depth knowledge of transport organisation in Australia.

(G. K. R. REID)
Acting Director

Bureau of Transport Economics
Canberra
September 1977

CONTENTS

TABLES

Page

Page

Page

Page

FIGURES

SUMMARY

'Cost recovery' is a term used to describe the levels to which various undertakings are able to recoup the costs of providing their services. Clearly, such a concept can cover a wide range of possibilities. In performing this study of cost recovery in Australian transport, the BTE took the view that results of the study should be based as closely as possible on actual financial transfers. However, the BTE also recognises that many transport services have both positive and negative spinoffs which cannot be accounted for in a direct financial sense. Some of the positive spinoffs are improved mobility, enhancement of trade and increased employment opportunities, while pollution and accidents are examples of negative spinoffs.

Within these limited boundaries, the BTE developed a formal framework for analysing cost recovery in Australian transport in the year 1974-75. Each major mode of transport is included, and the analysis is comprehensive in the sense that different areas and classes of transport operations within each mode are analysed wherever applicable or practicable. The study generally examines cost recovery from each transport 'task' by three sectors:

- The Commonwealth Government, in regard to its funding and policy activities (and its construction and other such activities in the cases of the ACT and the Northern Territory). However, operations by Commonwealth transport instrumentalities (e.g. TAA, QANTAS, ANL, ANR and territorial bus services) are basically not included in this sector, since they are constituted and operated on a quasi-commercial basis;

- State Governments, in regard to the same sorts of activities as those defined above for the Commonwealth. Again, these activities do not include operations by State transport instrumentalities (railways, ports and harbours authorities and so on);

- The 'Other' sector, which variously includes the infrastructure activities of Local Governments, operations by commercial firms and activities of quasi-commercial Commonwealth and State transport instrumentalities.

In addition, overall cost recovery levels (which could, with limitations, be regarded as the extent to which users 'pay for' transport services) are calculated where possible.

Within this framework, an analytical system of assessment of cost recovery is developed. This system is then used to determine cost recovery levels by the sectors outlined above in relation to specific tasks. Clearly, this process gives a substantial volume of results, which is difficult to summarise. Also, the assumptions made concerning capital valuation procedures have profound effects on estimated levels of cost recovery. However, using the capital valuation techniques preferred by the BTE, the general conclusions of the study can be summarised as follows:

- End users do not generally pay the full financial costs of providing transport services, with the notable and very considerable exception of certain classes of users of road systems. This is an indication that society in general implicitly values transport services more highly than the valuation given by financial markets for such services. On the other hand, this implicit social valuation in excess of market valuation may well be conditioned by lack of knowledge of the true nature of transport finances. It is not, in itself, a reason why cost recovery policies (or other similar mechanisms) should not be adjusted in line with altered circumstances;

- Many pricing practices adopted in transport in Australia have developed over time. In some cases, historic price structures have been subject to blanket adjustments at various times. In other cases, particular levies or subsidies which have been introduced to overcome short-term phenomena have gained a permanent place as part of the price structure. Both of these practices appear to have hidden the true nature of financial transfers in transport, and may therefore have led to inappropriate pricing policies;

- Within the sector definitions given above, Commonwealth and State Government cost recovery levels vary significantly. In fact, the various transport tasks attract cost recovery levels ranging from virtually zero to several hundred per cent!

- Recovery within the 'other' sector (which generally involves operational agencies) is far less variable;

- The results are generally in line with commonly-held views regarding cost recovery levels in particular modes and tasks. However, the BTE's preferred method of capital valuation yields lower estimates of levels of cost recovery than those given by the few limited studies performed elsewhere;

- The generally low estimates obtained in the study may indicate that insufficient attention is given to recouping capital costs in transport. If this is the case, it could have caused serious misallocation of resources in the past and it may well cause problems with investment maintenance in the future.

Individual results of the study are included with this summary. Both percentage cost recovery levels and amounts of transfers (surplus or deficit) are shown, to give some indication of both the relative performance and the levels of funding involved in particular activities. These summary results are included for ease of reference, but they should be treated as indicative, in the sense that their correct interpretation sometimes depends on a reasonable knowledge of the manner in which they are derived.

This, in turn, can only be obtained from a closer scrutiny of the detailed analysis of individual modes and tasks within this Report. In particular, only those results obtained by using the BTE's preferred method of capital valuation (termed the 'indexed historical cost' method) are summarised here, while the effects of alternative capital valuation methods are explored in detail in the body of the Report. It should also be noted that the summary results are reported in terms of practical identification of tasks, rather than in terms of the formal structure of the study itself. This procedure is adopted here because it overcomes problems of gaps which occur when different modal results are aggregated to a common basis. On the other hand, it also reduces the strict comparability of results.

On a broader front, the BTE concludes that the results of this study have a limited but nevertheless valuable application to policy development. In particular, this cost recovery study is regarded as only one of many required inputs to policy determinations regarding pricing and investments. Cost recovery, in itself, is a purely financial matter, and full pricing and investment decisions involve quantities and qualities which cannot be measured in financial terms alone. Since some of these additional inputs may involve assessments of non-pecuniary or intangible costs and benefits, they should therefore be resolved through political rather than analytical processes.

Finally, the Report contains some qualitative assessments of alternative policy instruments available for improving or adjusting cost recovery processes. One point which is particularly stressed is the desirability of specifically identifying government charges and subsidies where this is practical in an administrative sense. This is necessary if suitable public judgements on the acceptability of the financial status of particular transport services are to be formed.

SUMMARY OF RESULTS - AIR TRANSPORT

Sector Undertaking Recovery	Area of Operation	Class of Operation	Surplus(+) or Deficit(-) ($M)	Cost Recovery Level
Commonwealth Government	Domestic Trunk Operations	Passenger and Freight Combined	-52.3	52%
	Domestic Rural Operations	Passenger and Freight Combined	-35.4	18%
	Domestic General Operations	Passenger and Freight Combined	-50.0	13%
	All Domestic Operations	Passenger and Freight Combined	-137.7	34%
	International Operations	Passenger and Freight Combined	-25.1	57%
	All Operations	Passenger and Freight Combined	-162.8	39%
Other	Domestic Trunk & Rural Operations Combined	Passenger and Freight Combined	-33.0	93%
	Domestic General Operations	Passenger and Freight Combined	-15.3	78%
	All Domestic Operations	Passenger and Freight Combined	-48.3	91%
Overall	Domestic Trunk & Rural Operations Combined	Passenger and Freight Combined	-120.7	78%
	Domestic General Operations	Passenger and Freight Combined	-65.3	46%
	All Domestic Operations	Passenger and Freight Combined	-186.0	72%

SUMMARY OF RESULTS - SEA TRANSPORT

Sector Undertaking Recovery	Area of Operation	Class of Operation	Surplus (+) or Deficit (-) ($M)	Cost Recovery Level
Commonwealth Government	Coastal Operations	Passenger and Freight Combined	-15.9	7%
	International Operations	Passenger and Freight Combined	+2.3	118%
	All Operations	Passenger and Freight Combined	-13.6	56%
State Government	Coastal Operations	Passenger and Freight Combined	-3.4	74%
	International Operations	Passenger and Freight Combined	+11.5	187%
	All Operations	Passenger and Freight Combined	+8.1	131%
Other[(a)]	Coastal Operations	Passenger and Freight Combined	-205.7	58%
Ports and Harbours Authorities	Coastal Operations	Passenger and Freight Combined	-42.3	59%
	International Operations	Passenger and Freight Combined	-52.4	74%
	All Operations	Passenger and Freight Combined	-94.7	69%
Overall	Coastal Operations	Passenger and Freight Combined	-259.9	56%

(a) Excludes ports and harbours authorities in this context. See body of report for further details.

SUMMARY OF RESULTS - ROAD TRANSPORT

Sector Undertaking Recovery	Area of Operation	Class of Operation	Surplus(+) or Deficit(-) ($M)	Cost Recovery Level
Commonwealth Government	Urban	Passenger	403.0	414%
	Urban	Freight	88.0	224%
	Rural	Passenger	158.2	190%
	Rural	Freight	118.8	208%
	Urban and Rural Combined	Passenger and Freight Combined	768.0	258%(a)
State Government	Urban	Passenger	-36.2	92%
	Urban	Freight	-115.8	52%
	Rural	Passenger	-241.5	55%
	Rural	Freight	-199.6	47%
	Urban and Rural Combined	Passenger and Freight Combined	-750.9	57%(a)
Other(b) (Infrastructure)	Urban	Passenger	-17.7	92%
	Urban	Freight	-94.8	24%
	Rural	Passenger	-157.2	42%
	Rural	Freight	-156.1	26%
	Urban and Rural Combined	Passenger and Freight Combined	-489.9	44%(a)
Other(b) (Operations)	Urban	Passenger	-52.1	78%
	Urban	Freight	-231.9	84%
	Rural	Passenger	-3.2	85%
	Rural	Freight	37.8	105%
	Urban and Rural Combined	Passenger and Freight Combined	-249.4	90%(a)
Overall	Urban	Passenger	+351.4	144%
	Urban	Freight	-353.2	79%
	Rural	Passenger	-243.7	69%
	Rural	Freight	-217.2	80%
	Urban and Rural Combined	Passenger and Freight Combined	-462.7	89%(a)

(a) These figures are effectively 'totals' for recovery by the sectors indicated.

(b) The distinction is drawn between infrastructure and operations in the non-Commonwealth and non-State sectors for various reasons. Further details may be obtained by reference to the appropriate parts of the Report.

SUMMARY OF RESULTS - RAIL TRANSPORT

Sector Undertaking Recovery	Area of Operation	Class of Operation	Surplus(+) or Deficit(-) ($M)	Cost Recovery Level
Commonwealth Government	Urban	Passenger	-17.6	4%
	Non-urban	Passenger	-21.8	3%
	Non-urban	Freight	-32.2	4%
	Urban and Non-urban Combined	Passenger and Freight Combined	-71.6	4%[a]
State Government	Urban	Passenger	-62.6	48%
	Non-urban	Passenger	-50.4	42%
	Non-urban	Freight	-167.6	34%
	Urban and Non-urban Combined	Passenger and Freight Combined	-280.6	39%
Other	Urban	Passenger	-190.7	42%
	Non-urban	Passenger	-96.5	49%
	Non-urban	Freight	-310.2	67%
	Urban and Non-urban Combined	Passenger and Freight Combined	-597.4	59%[a]
Overall	Urban	Passenger	-179.6	40%
	Non-urban	Passenger	-91.9	46%
	Non-urban	Freight	-299.2	67%
	Urban and Non-urban Combined	Passenger and Freight Combined	-570.7	59%[a]

(a) These figures are effectively 'totals' for recovery by the sectors indicated.

CHAPTER 1 - INTRODUCTION

The Commonwealth Government is involved in many types of public activity relating to transport in Australia. It is also directly involved in the Australian transport industry. The Commonwealth Department of Transport is the Government's primary administrative arm in the transport field, and it assists in formulating policy regarding both domestic and international transport. It is also involved in funding and co-ordinating State transport activities and initiatives. As a consequence of these functions, the Commonwealth Government develops, implements and administers statutes and regulations regarding transportation.

In addition to these conventional roles of central or federal governments, Commonwealth Government departments, instrumentalities and other associated bodies provide, own and operate large-scale transport facilities and services.

In the field of air transport, these facilities and services include major airports, the international airline QANTAS[1] and the domestic airline TAA[2]. The Commonwealth Government (through the Department of Transport) also provides aviation services[3].

In a similar fashion, the Commonwealth Government owns and operates the Australian shipping line ANL,[4] and provides shipping

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(1) QANTAS is actually a private company registered under the Companies Act. However, the Directors of QANTAS hold 100 per cent of the paid-up shares in trust for the Commonwealth Government.

(2) TAA (Trans Australia Airlines) is the trading name for the Australian National Airlines Commission, which is a Federal statutory authority created under the Australian National Airlines Act 1945-75.

(3) Aviation services include the licensing and examination of crews, maintenance engineers and airports. They also include the issue of airworthiness and other authorizations and the provision of service publications and various types of aeronautical information.

(4) ANL (Australian National Line) is the trading name for the Australian Shipping Commission, which is a Federal statutory authority created under the Australian Shipping Commission Act 1974.

with navigation aids and essentially the same range of ancillary services as that provided for air transport. However, the government is not as directly involved in providing and operating maritime ports as it is in the corresponding activities for airports.

In the past, the Commonwealth Government's operational role in rail transport was limited to its responsibilities for the Federal territories, and for operations on the Trans-Australian, Central Australian, and North Australian Railways. More recently, establishment of the Australian National Railways Commission (ANRC) has given the government a direct role in rail operations in two States[(1)], in addition to its earlier role.

The situation regarding roads is rather different. The Commonwealth Government has a considerable involvement in providing finance for road construction, improvement and maintenance. However, it is generally not directly involved in road transport operations. The exceptions to this include bus operations in the Federal territories and ancillary road transport operations related to defence, administrative services, communications and so on.

Furthermore, the Commonwealth Government has a redistributive role in line with normal practice for governments of all kinds. Through the re-distribution of monies as loans, grants and subsidies, the Commonwealth Government therefore influences much of the investment in Australian transport infrastructure. Consequently, it influences the operation of all forms of transport services, even if only indirectly. The services which are influenced in this manner need not necessarily be either owned or operated by the Commonwealth Government itself.

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(1) The Commonwealth Government is now responsible for Tasmanian and non-metropolitan South Australian rail services.

In addition to transport users and operators who benefit directly from government activities in transport, there may also be non-users who receive indirect benefits from these activities. Often it is possible for users and/or beneficiaries to be identified readily, thereby allowing introduction of systems of user charges for some services. Historically, such charges have been progressively introduced across the whole range of transport services provided by the Commonwealth Government. Both the levels and scope of these charges have usually been increased with time, as transport services have become more complex.

The first Commonwealth Government transport services for which specific charges were levied were those related to light dues for coastal shipping. In 1915, the States relinquished to the Commonwealth Government the rights to levy such dues. Fees for the administration of some marine standards were first introduced in 1920. These standards have now been broadened to include ship surveys, examination of seamen on Australian ships, voyage licenses and oil pollution levies. Charges for facilities provided by the Commonwealth Government to air transport were first introduced in 1947. Since then, the levels of charges and the complexity of the mechanisms by which they are derived have both been expanded markedly. Clearly,the overall structure of charges for transport-related services provided by government is considerably more complex than shown here, but these examples are an indication of historic developments in this area.

ORIGIN OF THIS STUDY

All members of society receive benefits from transport, whether or not they directly use such services. Furthermore, the satisfaction which beneficiaries (as opposed to direct users) derive from transport does not directly affect the level of services available to users. Finally, beneficiaries, as opposed to users, very often cannot be identified and charged for the gains which they make from transport. These aspects of transport are characteristic of public goods, a further example of which is national defence preparedness. Another important facet of transport is that it has differential income impacts. In earlier years, it was generally accepted that Federal Governments only provided services in the transport field on the basis that there were significant 'public good' elements in such services. For example, provision of sea transport infrastructure related to the safety of shipping was accepted as a government responsibility. One reason for this was that the risks and profits of shipping were not borne equally by the same sections of society. Another reason was that all Australians benefitted greatly from sea transport, but satisfactory procedures for levying equitable charges upon individuals were not available. On the other hand, initial government involvement in airline and airways operations was partly for this reason, but was also on the basis that government aid was a prerequisite for development of a viable airline system in Australia. In effect, the origins of the present study lie in this latter point. As time went on, a viable airline industry did develop in Australia (as in virtually every other country). Therefore, the 'development' role of government assistance became somewhat less relevant, but the fact remained that the Commonwealth Government was still very heavily involved in airline infrastructure (among other aspects). Therefore, rather than withdraw from this field, the previous involvement continued on the basis of providing infrastructure, but with appropriate charges being made. As mentioned above, such charges were first introduced in 1947.

In 1961, the objective of 'eventually achieving full recovery of the cost of facilities and services properly attributable to civil air transport'[1] was explicitly stated for the first time in Clause 8 of a revised Airlines Agreement. This objective was recognised in principle by the airlines which were party[2] to the Agreement. However, no specific target for recovering costs was established until 1973.

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(1) Airlines Agreement Act 1952-1973.
(2) These airlines being Ansett Transport Industries (trading as Ansett Airlines of Australia) and Australian National Airlines Commission (TAA).

Following consideration of the Coombs' task force report (1), a new Airlines Agreement contained the target of recovering 80 per cent of Commonwealth Government costs attributable to air services by 30 June 1978. Concurrently, several changes to the manner in which charges were determined were made, and limits were set to the rates at which overall charges and some of their elements could be increased. These measures were:

- The maximum annual rate of increase in domestic airline charges was raised from 10 to 15 percent;
- International charges were to be increased by the same percentages as those applied to domestic airlines;
- The Commonwealth Government was to consult with TAA and Ansett Transport Industries (ATI) on forward expenditure programs for airports and other civil air facilities;
- The parties to the Agreement were required to negotiate the levels of charges necessary to achieve the cost recovery target;
- Revenues raised by excise or tax on aviation fuel were recognised as charges offsetting recoverable costs;
- The 1961 stipulation that taxes on aviation fuel would not be raised faster than excise on motor spirit was confirmed;
- These charges were to remain in force until 30 June 1978.

Following the change of government in 1975, further attempts to increase the overall recovery target for air transport were held in abeyance. However, charges were increased by 15 per cent rather than by the higher rate implied by a combination of inflation and stated cost recovery targets. A maximum annual increase in air navigation charges is embodied in the Airlines Agreement of 1973.

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(1) Coombs H.C. (Chairman), Review of the Continuing Expenditure Policies of the Previous Government, Report of the Task Force Appointed by the Prime Minister, Canberra, AGPS, 1973.

However, there were significant adverse reactions to even these increases in charges for Commonwealth services to air transport. Therefore, equity aspects of the levels of cost recovery for Commonwealth services to other modes came into question.

As a result of this, the Minister for Transport announced that the Government would examine the whole question of cost recovery for all modes. In particular, it would discuss operating and maintenance costs with the air industry. The Minister also asked the Bureau of Transport Economics to make a comparative study of the levels of cost recovery in the various modes of transport. This Report presents the outcome of the BTE investigations.

Terms of Reference

The formal terms of reference for the BTE's study were laid down by the Minister for Transport on 9 February 1976. They directed the BTE to:

> '...investigate and report on the comparative levels of cost recovery in the various modes and operational areas of Australian transport. The specific objectives of the investigation are to:
>
> - develop an economic basis for comparing the levels of cost recovery in the various modes and operational areas (of the transport sector);
> - determine historical levels of cost recovery in the various modes and operational areas;
> - indicate impacts on transport costs, demand and modal split of differing rates of cost recovery between modes in the performance of specific tasks;
> - examine alternative charging methods for increasing cost recovery in the various modes and operational areas;
>
> The BTE is free to investigate and report on any other matters relevant to cost recovery in Australian transport.'

THE VALUE OF COST RECOVERY STUDIES

All organisations involved in recouping the costs of transport operations engage in cost recovery studies of various types, although they may not be specifically regarded as such. Whether they are performed in government departments or commercial firms, cost recovery studies are essentially financial exercises in which historical costs and revenues are weighed against each other. They are essentially carried out in order to assess past performance in a manner analogous to the determination of the annual balance sheets of commercial organisations.

These results may also be used as part of the information necessary for formulating new policies concerning pricing and investment in transport facilities and services. However, pricing and investment decisions must necessarily be based on expectations of future demands, supplies, costs, revenues and resource availability. Therefore, historical financial information is not in itself sufficient to back such decisions. The value of cost recovery information in carrying out such processes basically depends upon the degree of change anticipated over the period to which the relevant expectations apply. However, cost recovery information can be used quite validly to determine constraints within which pricing and investment policies should operate. This can occur despite the fact that cost recovery is in no way a substitute for legitimate pricing policies, especially in public enterprise. These aspects of cost recovery study results will be dealt with in greater detail in Chapter 8 of this Report.

It cannot be stressed too greatly that cost recovery studies of the type presented in this Report only give a picture of past happenings. Even within this constraint, they generally only present a cross-section of the situation at a particular point in time. This does not inhibit their fundamental value, since a formal appraisal of the past performance of policies and operations is almost always valuable. Nevertheless, there are inherent dangers in using this type of information to predict future performance.

Scope of the Study

All modes of transport are examined in this study, and cost recovery analyses are included for most facets of transport operations within each mode. However, a number of areas of operation have been excluded from the analysis for various reasons. In many instances, the operations excluded from the study represented such an insignificant portion of the Australian transport task that it was considered unwarranted to examine them separately. An example of such a case was the exclusion of coastal passenger operations from the analysis of sea transport.

On the other hand, a number of transport operations were at least partially excluded or were included in other categories because no appropriate data were available for a separate examination. On this basis, private-sector international airline operations could not be examined because of the lack of information on many of the airlines flying to and from Australia. Given those instances where data are available, the proportions of costs and revenues attributable to Australian and overseas operations cannot be separated out on any acceptable basis. On the other hand, Commonwealth Government costs and revenues relating to international airlines are examined in some detail. Each of these exclusions has been detailed in the later chapters relating to the analysis of individual modes of transport.

In addition to these specific exclusions, all defence-related transport activities have been ignored, as they were considered to be outside the scope of normal transport activities by the usual definitions.

SCOPE AND LEVEL OF ASSESSMENT

The issues involved in cost recovery studies are complex. The principal problems with studies of this type are discussed in Chapter 3 of this report. However, these problems are compounded by the fact that there are a number of levels in the economy which could be appropriate to this type of study. Each of these levels, if adopted, will yield differing results. Similarly, the results will depend on the degree to which transport operations can be identified as such for inclusion in the study. Therefore, it is useful to consider the scope of the study and the level at which the assessment of cost recovery is carried out.

BTE studies are usually conducted at the overall national level, where taxes and subsidies are irrelevant since they are transfer payments and therefore do not represent resource costs. The terms of reference for this study indicate that its main thrust is to establish the extent of overt and covert subsidies (if any) to the different modes, areas and tasks. Clearly, an analysis aimed at assessing this type of situation must include existing taxes and subsidies. Since taxes and subsidies are not specifically identified or included in studies conducted at the national level, this level is clearly inappropriate for the current study.

At the level of individual modes, ancillary transport operations related to particular modes and tasks would be hidden in the analysis because of data limitations. An example of practices which would cause such problems are the absorption of rail feeder service costs by liner shipping companies. The mode level is therefore also clearly inappropriate for a study of this type.

The only satisfactory way to perform the analysis so that it will largely fulfil the terms of reference is to carry it out at the task[1] level. Each transport task must be treated as a separate enterprise to which taxes are actual costs and subsidies are actual revenues. Details of the analytical framework within which tasks are defined for this purpose are given below.

Analytical Framework

In this study, Australian transport was examined on a task basis. Cost recovery for particular tasks was identified by subdividing where appropriate on the basis of:

- Mode;
- Area of operation;
- Class of traffic or operation;
- The sector undertaking recovery (Commonwealth Government, State Government and other (including private enterprises)).

The general categories adopted for these attributes are shown in Table 1.1. It should be noted that this formal breakdown into the categories shown in Table 1.1 is intended for comparisons between results at a fairly high level of aggregation. The results for each mode cannot be compared on any low-level detailed basis, since there are fundamental differences in organisation between the modes. For example, domestic air services are commonly thought of as 'trunk' and 'other', with trunk routes being those on which competitive services operate[2]. No such distinction can be drawn readily for, say, non-urban rail passenger services. Therefore, the categories in Table 1.1 are used essentially as a 'lowest common denominator' on which intermodal comparison can be based, even though individual modes may be treated in a greater degree of detail. The structure of this framework is shown in Figure 1.1.

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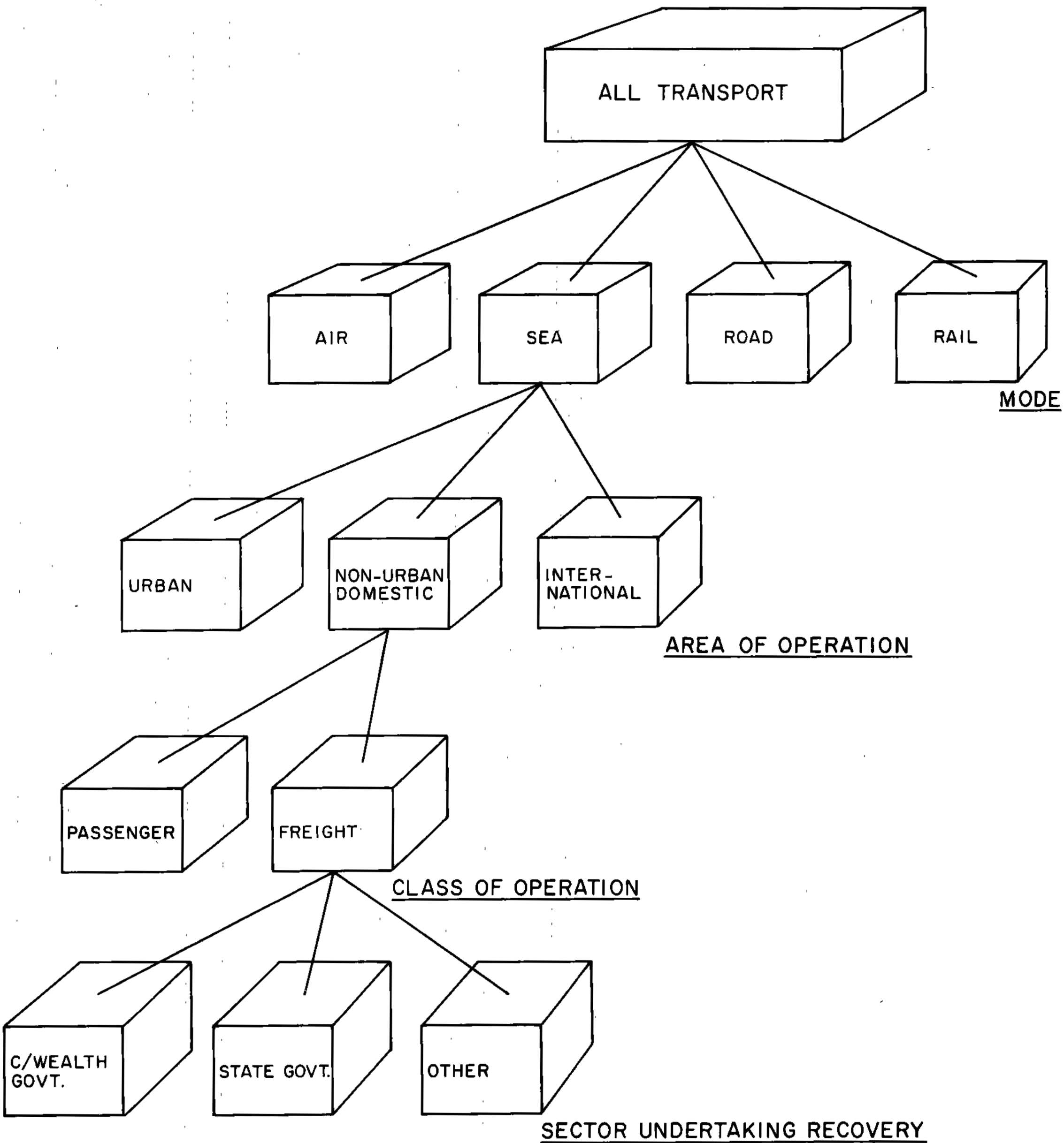
(1) A 'task' is defined as a group of transport activities or undertakings that are closely related because of similarities in functions, objectives or means of achievement.
(2) This is a definition apparently derived from the practice of assessing domestic scheduled carriers' operations on the basis of 'competitive' and 'non-competitive' routes.

TABLE 1.1 - BASIS FOR CLASSIFYING AUSTRALIAN TRANSPORT BY TASKS

ATTRIBUTE	CLASSIFICATION
Mode	Air Sea Road Rail
Area of Operation	Urban Non-Urban Domestic International
Class of Operation	Passenger Transport Freight Transport Infrastructure
Sector Undertaking Recovery	Commonwealth Government State Government Other (including Private)

While it is not really essential to the study, it is nevertheless valuable to examine the financial inter-relationship between the categories in Table 1.1. The sources of revenues and costs and the flows of funds for air transport are shown schematically in Figure 1.2. Corresponding diagrams for the sea, road and rail modes are given in Figures 1.3, 1.4 and 1.5 respectively. It should be noted that these diagrams are simplified, and that the real situation is far more complex. For example, income and other taxation is collected by the Commonwealth and State Treasuries from both users and non-users of transport services and facilities. However, only those taxes and charges relating to direct use have been included in these diagrams. Joint costs are represented in these diagrams by areas which are not divided between tasks.

Finally, it has already been stressed that the national viewpoint is not necessarily directly relevant to cost recovery studies per se. However, subsequent chapters of this report deal with government pricing and investment decisions and with alternative cost recovery methods. Therefore, despite the general concentration on 'tasks', there will obviously be a need to cover questions of the 'national interest' in some cases.



NOTE: The complete taxonomy implied by the classification system (Table I·I) is not shown since it results in 72 groups. This would not only lead to cumbersome presentation, but many of these groups are not relevant (e.g. all recovery from international rail freight)

FIGURE I·I

FORMAL STRUCTURE OF TRANSPORT TASKS

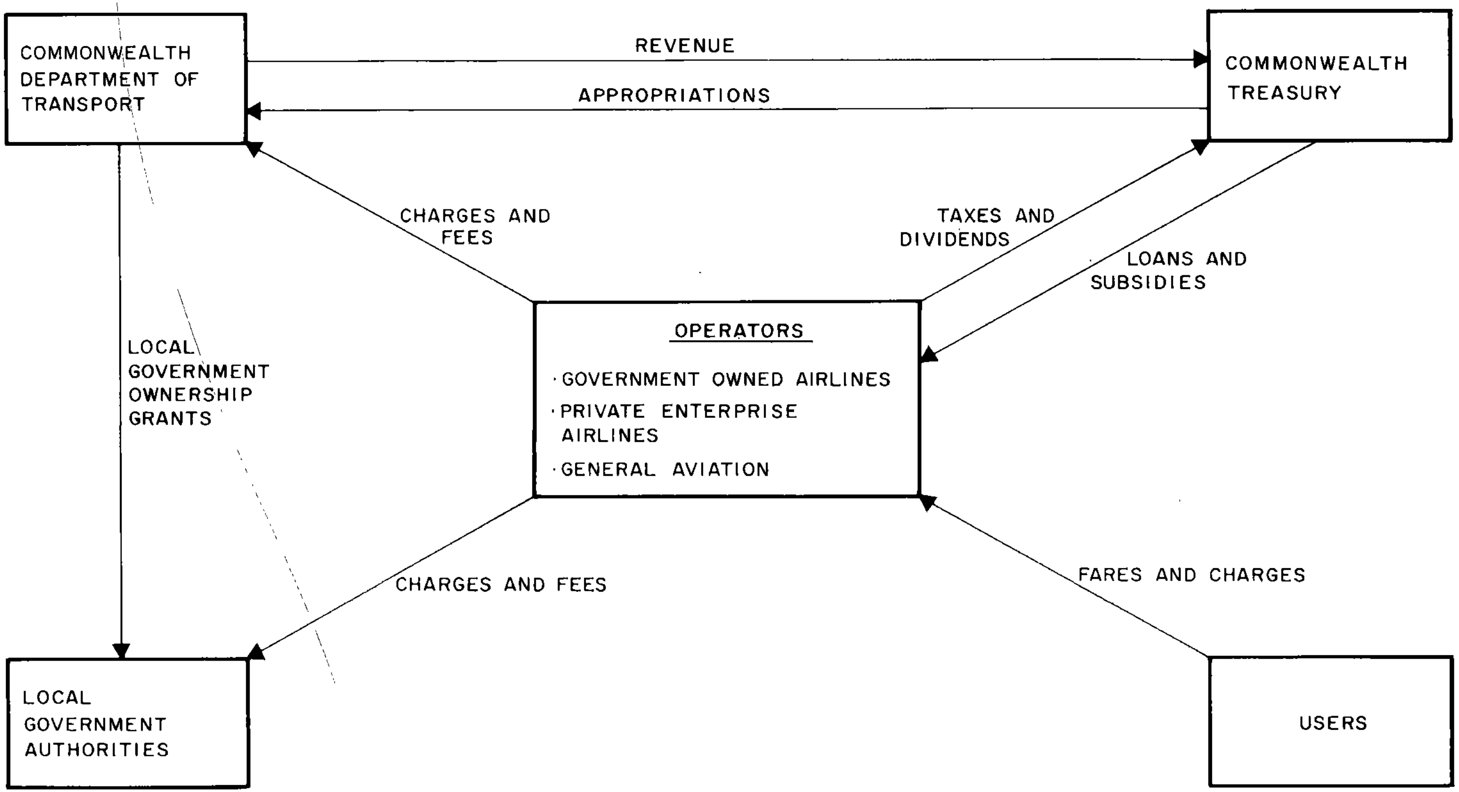


FIGURE 1·2

SCHEMATIC REPRESENTATION OF THE FLOW OF FUNDS IN AIR TRANSPORT

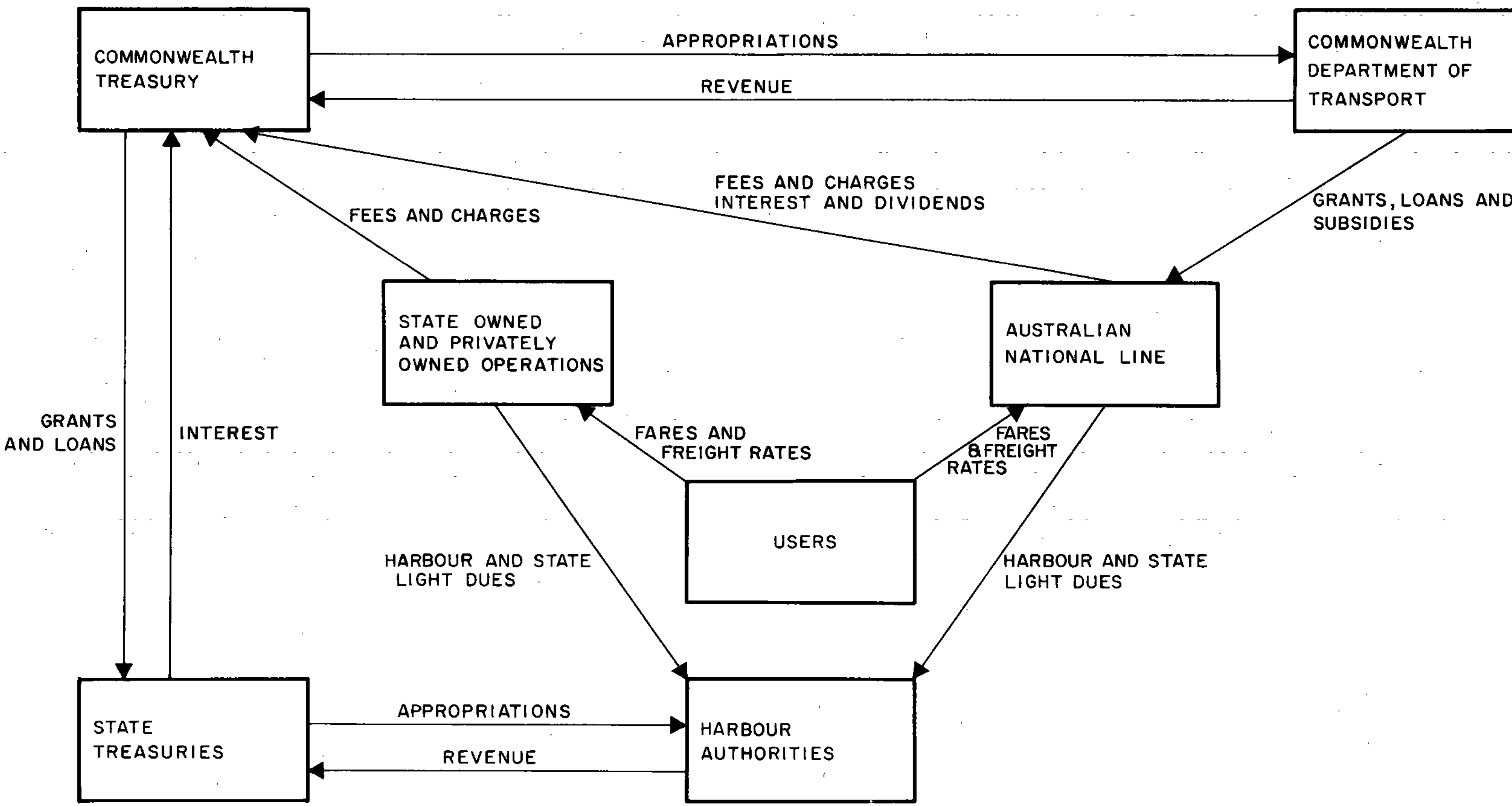


FIGURE 1·3

SCHEMATIC REPRESENTATION OF THE FLOW OF FUNDS IN SEA TRANSPORT

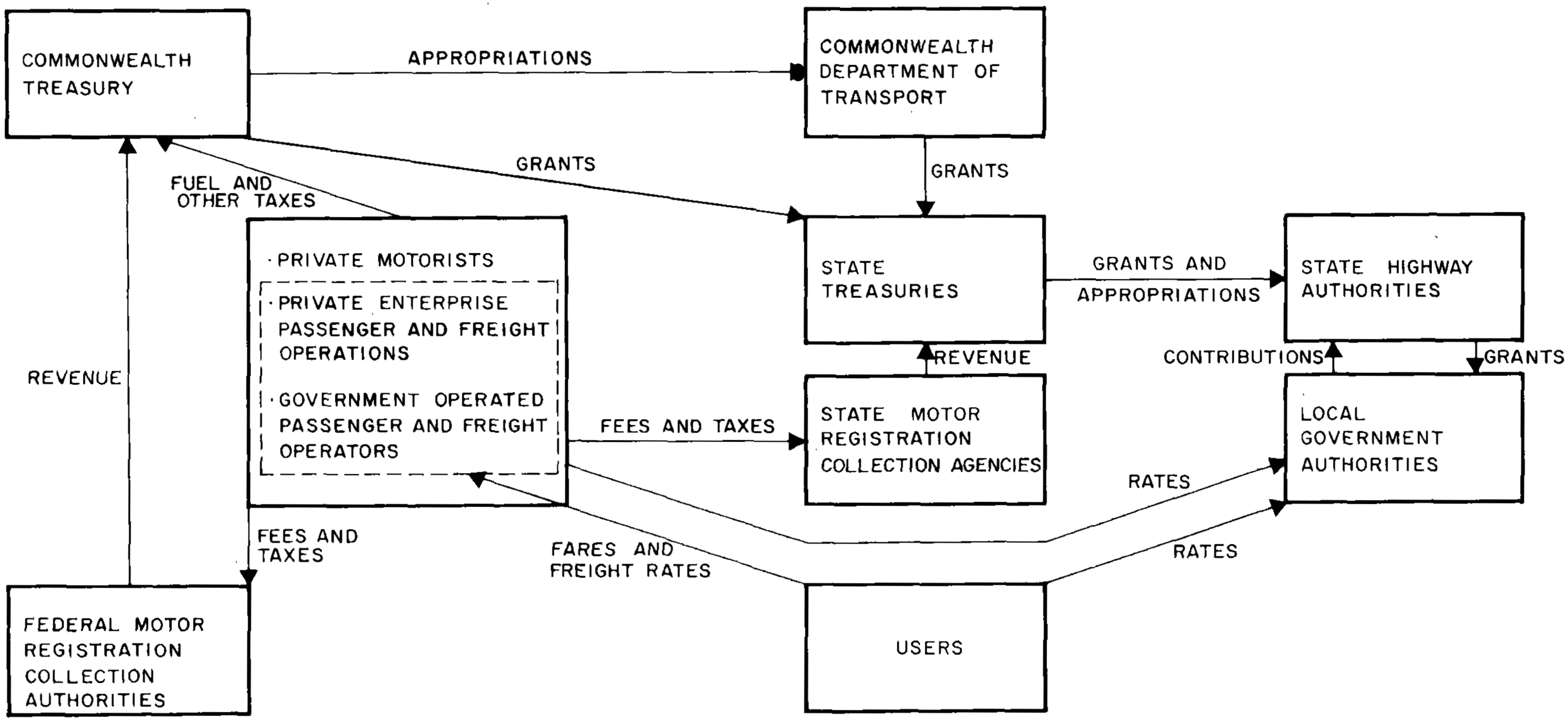
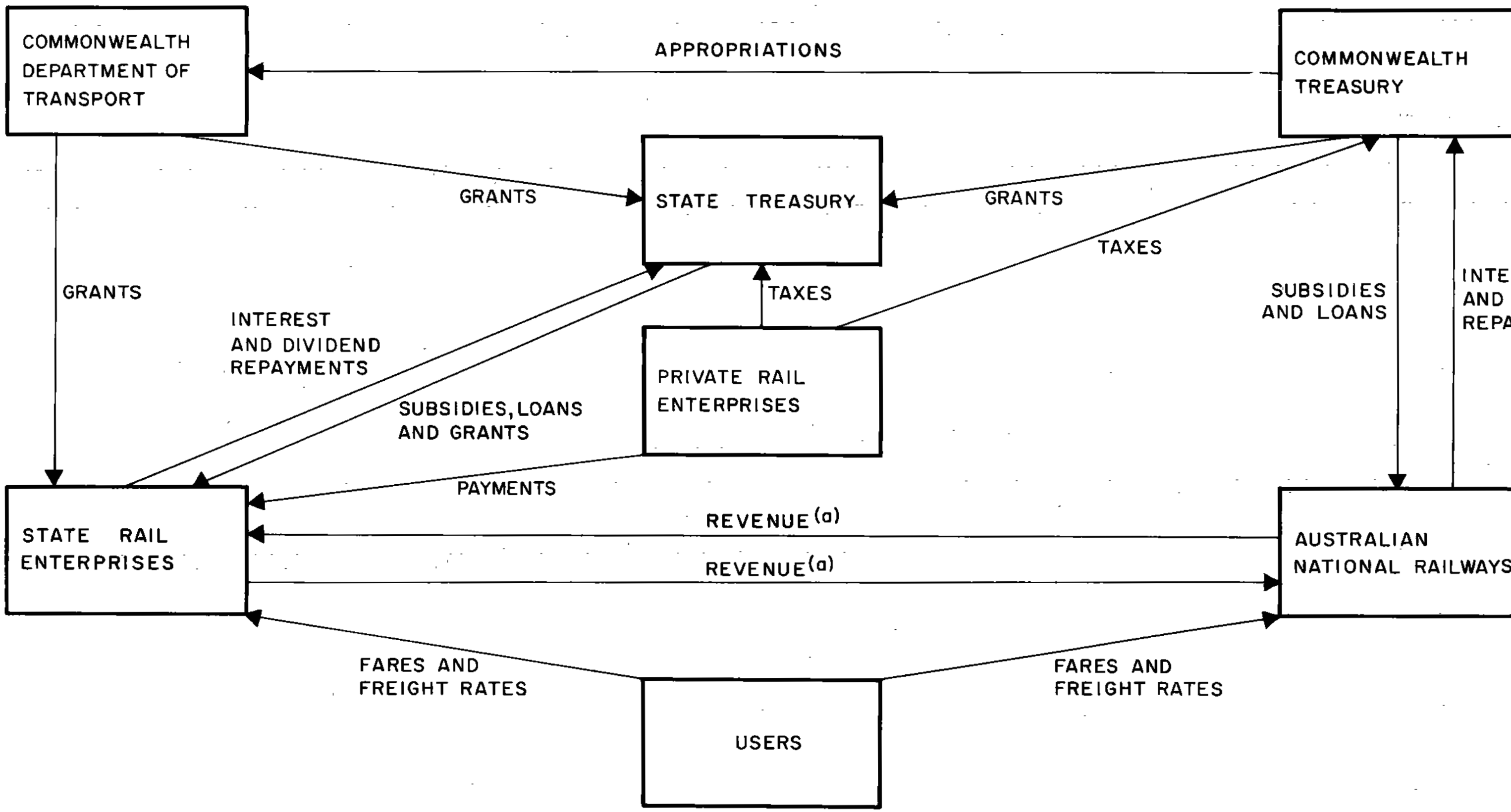


FIGURE 1·4

SCHEMATIC REPRESENTATION OF THE FLOW OF FUNDS IN ROAD TRANSPORT



(a) Transfer of revenues collected on behalf of other agencies

FIGURE 1·5

SCHEMATIC REPRESENTATION OF THE FLOW OF FUNDS IN RAIL TRANSPORT

It is stressed, however, that cost recovery, both as a concept and as a specific policy, is regarded essentially as a financial matter. Its relationship to less tangible matters (including those involved in such concepts as 'social good' and 'national interest') is regarded as fairly tenuous. The BTE's view is that cost recovery policies are quite separate from these latter concepts. Nevertheless, cost recovery policies may impose specific constraints within which the broader concepts must be framed.

CHAPTER 2 - CURRENT GOVERNMENT FISCAL POLICIES FOR TRANSPORT COST RECOVERY

As mentioned previously, charges for the use of transport facilities and services provided by the Commonwealth Government have been progressively introduced, increased and otherwise modified since 1915. Although they are not strictly related to the analytical framework of the BTE's study, there are several specific government policies which cover cost recovery in transport. There is some value in a brief statement of the implications of such policies. Therefore, this chapter contains a general summary of current Federal fiscal policies towards transport, emphasising those which are specifically aimed at recovering costs. It also outlines some related State activities in the transport field. In general, costs and revenues are not shown in this chapter, as their inclusion would pre-empt the detailed results of the study, which are presented in Chapters 4 to 7.

The summaries given in this chapter should not be regarded as either comprehensive or definitive. They are included to provide an indication of the thrust of past and present policies for transport cost recovery. Full examination of the scope and implications of these policies would involve considerably more detail than is warranted in this Report.

AIR TRANSPORT

The Federal Role in Air Transport

The Commonwealth Government (through the Department of Transport) controls the operation of air transport in Australia. Its responsibility in international and interstate air transport is derived from its powers under the Constitution and by powers ceded to it by the States in respect to interstate air transport. Activities of the Commonwealth cover the establishment and administration of domestic and international air transport policy. It also provides the major infrastructure used for air transport activities, it owns and operates the domestic airline TAA, and it is the effective sole shareholder in the international airline QANTAS. At present, specific Federal cost recovery objectives for air transport are limited to airport and airways charges.

Airports and Airways

The Department of Transport levies two major types of charges which are specifically aimed at achieving stated cost recovery goals. These are:

- Air navigation charges. These charges are covered by Schedule 1 to the Air Navigation (Charges) Act 1952-1974, and are payable by the holder of an airline licence where a regular transport operation involves:
  - (a) a flight between places in Australia; or
  - (b) a landing in Australia from another country or a take-off from Australia for another country.

  In addition, Schedule 2 of the same Act allows for charges to be levied for private aircraft, charter aircraft and aircraft engaged in aerial work. These charges are payable by holders of certificates of registration on an annual basis.
- Payments by lessees and concession holders.

In addition to these specific charges, the Federal Treasury collects excise on fuel used in air transport operations. Receipts from both sources are considered as revenues collected against the attributed(1) costs of the Department in carrying out the following functions:

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(1) In this context, 'attributed' has a specific meaning in terms of the Air Navigation (Charges) Act 1952-1974. It applies to those cost elements which have been defined as costs incurred in providing, maintaining and operating airport and airways facilities. It does <u>not</u>, for example, apply to costs involved in carrying out the regulatory and safety functions of the Department of Transport. These latter costs are not currently subject to recovery through normal cost recovery policies.

- Maintenance and operation of airports and airways facilities;
- Payments to local authorities on a 50:50 basis for maintenance and development of locally-owned airports;
- Payments to the Bureau of Meteorology for weather forecasts for aviation;
- Administration of the maintenance and operation of airports and airway facilities, including wages and salaries involved in Central Office administration;
- Interest and depreciation on assets employed in providing the services detailed above, based on historical costs and rates of interest;
- Superannuation liability for those officers engaged in operating and administering the relevant services.

The scale of air navigation charges is extensive and they are generally determined in a complex fashion. For this reason, a comprehensive schedule of charges is not provided in this Report. However, Table 2.1 lists current levels for some of the more common charges. Domestic air navigation charges are determined for individual routes, and include take-off charges, landing charges, and additional charges for the particular route itself. The charges for international airlines entering or leaving Australia are determined separately, and depend on the direction of entry or departure. International aircraft flying internal domestic routes pay the same charges as domestic aircraft, with appropriate adjustments for aircraft type.

Levels of recovery of costs are calculated by the Department of Transport within a broad framework of various Government decisions. These calculations are based on attributions and allocations agreed to by the Department, the airlines and other parties involved. These indicate that cost recovery has increased steadily over the years up to 1974-75. However, as later parts of this report will show, the basis on which such calculations are performed differs considerably in some respects from that adopted by the BTE.

TABLE 2.1 - SOME TYPICAL AIR NAVIGATION CHARGES[a] AS AT 30 NOVEMBER 1976

Service and Aircraft Type	Charge
	$
International[b]	
. Into or from Sydney	
Boeing 747	1925
Boeing 707	824
. Melbourne-Perth-Overseas Combined	
Boeing 747	4812
Boeing 707	2061
Domestic (Per Flight)	
. Melbourne-Sydney	
Fokker F27	36
McDonnell-Douglas DC9	116
Boeing 727-200	247
. Melbourne-Perth	
Fokker F27	108
McDonnell-Douglas DC9	349
Boeing 727-200	742
General Aviation (Annual Fees)	
. Private	
Cessna 182	371
Aero Commander 690	1359
. Aerial Work	
Cessna 182	741
Aero Commander 690	2718
. Charter	
Cessna 182	926
Aero Commander 690	3398

(a) Source: Air Transport Policy Division, Department of Transport.

(b) These charges were current before recent changes were introduced to cater for the effects of different entry or departure directions. The charges noted were applicable to each take-off or landing.

The official determinations show that receipts from international operations have now reached full cost recovery levels. Major domestic operations are approaching full recovery, whilst rather less than full recovery is obtained from rural domestic services. The level of recovery is least from operations over routes to remote areas such as the Tasmanian Islands, inland Queensland and pastoral stations in Northern Australia. An even larger deficit exists in the general aviation area. In fact, this deficit has reached such an extent that attempts to recover costs fully would probably result in a marked decrease in such activity. As stated in Chapter 1, a Commonwealth Government goal of achieving 80 percent cost recovery for air transport by 30 June 1978 is currently being held in abeyance.

Aviation Services

Aviation services include a range of peripheral activities related to operation of the Australian airways system. Many of these services are of a regulatory nature, and until recently were not regarded as 'attributable' in the specific sense defined earlier in this chapter. The principle of charging for these services was adopted in 1974, but has not as yet been implemented. Some of the functions for which charges could be levied are as follows:

- flight crew licensing;
- flight crew examination;
- aircraft maintenance engineer licensing;
- aircraft registration;
- issue of airworthiness authorisations;
- issue of approval for organisations involved in the aircraft industry;
- issue of aeronautical information;
- service publications;
- air service licensing;
- airport licensing;
- issue of building permits.

Legislation would be necessary before charges for some of these items could be introduced. Legal opinion suggests that the Constitution would prohibit recovery of any amounts in excess of the direct costs of providing such services. At this stage, it is not envisaged that charges would be made for surveillance or for the development of standards for aircraft and airports, among other possibilities.

Locally-Owned Aerodrome Scheme

This scheme is mentioned in this Report since it is an example of the involvement of the Department of Transport in providing services to air transport indirectly on a cost-sharing basis. However, the Department does not receive revenues under this Scheme, which involves transfer of the ownership and operation of smaller aerodromes from the Commonwealth Government to the appropriate Local Governments. Most of the facilities included in this Scheme are only used by small commuter aircraft and by private fliers, although some facilities are also used by intra-state rural air services. The latter include people belonging to parachuting and gliding clubs.

The Department of Transport negotiates the transfer of control of these aerodromes with the relevant Local Government Authority (LGA). The usual terms of transfer include the following:

- No charge is made by the Department for the facility;
- The Department undertakes any agreed pre-transfer works;
- The Department agrees to meet 50 percent of maintenance and development costs of the aerodromes (except that the full costs of upgrading to a jet facility are met by the Department when this upgrading is deemed to be warranted);
- The LGA may levy whatever charges it sees fit for the use of the aerodrome subject to approval by the Department.

The Department's expenditure on locally owned aerodrome maintenance and development in the financial year 1974-75 was approximately $1.2M. This represents considerably less than 1 percent of the total direct operating costs of the Department of Transport's activities in the airways field. It is reasonable to assume that the local government authorities would have expended broadly the same amount, under the 50:50 cost-sharing agreement.

QANTAS and TAA

These airlines are required to operate on a commercial basis. They actually or implicitly pay dividends to the Federal Government. They also pay interest on loans to the Australian Treasury. Therefore, they operate in a manner closely analogous to that of their private enterprise counterparts. Consequently, cost recovery goals for QANTAS and TAA are implicitly at least 100 percent. Of course, actual cost recovery at any particular point in time depends on whether or not these airlines are operating profitably. In turn, this can depend on general industry conditions, and may therefore be outside the realm of specific cost recovery policies.

State Government Activities in Air Transport

As mentioned previously, State powers to control intrastate air activities have been ceded to the Commonwealth Government. Therefore, direct State powers relating to the air mode are not significant. Despite this, State Governments retain considerable interest in air matters, since such matters frequently have local implications. Thus, the effects of airports on local employment, residential zoning and land transport are considerable, and this reflects back into State planning operations. Similarly, developmental air services are often a valuable instrument for fostering growth in particular areas, sometimes with profound results. These interactions are becoming more important as the scale of air operations increases, and may involve future formal State policies relating to matters such as airport access. However, this possibility has not been taken into account in this Report.

State governments also operate a range of services which are peripheral to airways operations. Foremost among these could be the various State Tourist bureaux, which have a fairly significant role in fringe travel arrangements. However, these activities are inextricably bound up with other matters (including other transport modes and general promotion of a whole range of State activities and attributes), and it is not really possible to separate specific modal arrangements for the purposes of this Report.

SEA TRANSPORT

The Federal Role in Sea Transport

The Commonwealth Government has a diversity of roles in Australian sea transport. The Department of Transport is responsible for administration of the Navigation Act 1912-1973. In the terms of this Act, the Department is responsible for marine standards covering vessels, seamen, cargoes and ships' equipment. It also staffs and maintains the Marine Operations Centre(1), provides a Secretariat for the Marine and Ports Council of Australia (MPCA) and advises the government on both domestic and international shipping policy matters. In its redistributive role, the Commonwealth Government subsidises the ship-building industry and also subsidises freight rates on certain routes. It also provides a significant portion of the infrastructure needed for sea transport operations. The latter includes lights and other navigation aids, communications facilities, an explosives jetty at Point Wilson (Vic), and some ports such as Darwin and Jervis Bay. Finally, the Commonwealth Government owns and operates the Australian Shipping Commission(2).

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(1) The Marine Operations Centre functions as a central reporting agency for shipping movements, and is responsible for co-ordinating search and rescue operations.

(2) Trading as the Australian National Line (ANL).

These functions are discussed in some detail below, particularly in relation to their importance regarding cost recovery in transport.

Marine Standards

Administration of the Navigation Act 1912-1973 and its associated regulations involves wide-ranging action by the Department of Transport. Marine standards are laid down to ensure that vessels entering or leaving Australian ports comply with both international regulations and specific local requirements. Matters covered by these regulations and requirements include the engagement and discharge of seamen, cargo safety and the qualifications of officers and crew members for operating Australian ships. They also include surveys of the condition and operation of ships and their equipment, and control of vessels engaged in coastal trades.

Fees are currently charged for the following services:

- Mandatory inspections;
- Ship surveys;
- Examinations;
- Mercantile Marine Office functions (central administration, international agreements, etc.); and
- Single voyage permits for ships owned by overseas agencies.

Scales of the more common charges applying to marine standards are shown in Table 2.2.

No specific cost recovery target has been established for Marine Standards charges. At present, the fees are based upon capacity to pay, and until recently they were closely related to fees prescribed for similar services in the U.K. Cost recovery levels tend to be low.

TABLE 2.2 - SOME TYPICAL CHARGES[a] FOR MARINE STANDARDS SERVICES AS AT 1 JANUARY 1977

Service and Basis of Charge	Charge
	$
Examination of Engineers First Class	9.00
Medical Examination of Seaman	2.00
Engagement or Discharge Fee for Seaman	0.60
Inspection (first visit) pig iron, coal and ballast	12.00
Inspection (first visit) grain	12.00
Dangerous Goods Inspection (inflammable) (first visit)	12.00

(a) Source: Sea Transport Policy Division, Department of Transport.

Coastal Services

The Department of Transport has a specific function in relation to coastal services. In fulfilment of this function, it provides, operates and maintains a system of navigation aids to ensure the safe passage of vessels around the Australian coast. There were 336 marine navigation aid installations provided by the Department of Transport[1] in service in Australia in 1974-75. These included manned and automatic lights and other devices. Departmental staff are responsible for the installation, operation and maintenance of such devices, and the Department supports such things as service ships which are involved with these activities.

During the same year, the Department's Marine Operations Centre dealt with 1278 incidents involving search and rescue activity. Cyclone 'Tracy' gave rise to a substantial proportion of these operations. In addition to these functions, the Centre further developed the Australian ship reporting system.

(1) Department of Transport, Australian Transport 1974-75, p. 133.

No charges are levied for the activities of the Marine Operations Centre. Charges for navigation aids are made in conjunction with an oil pollution levy. These charges consist of 31 cents per net registered tonne (NRT) and 1 cent per NRT respectively. The total fee of 32 cents per NRT is applicable to a quarter of the year and is payable on the first visit in the quarter. Fishing and naval craft are exempt. A review of these charges, with the aim of restructuring them, is presently under way. Again, there is no specific cost recovery target, but Departmental analyses of revenues and costs over recent years suggest that full cost recovery tends to be achieved.

Subsidies for Shipping

The Ship Construction Bounty Act 1975 gave statutory recognition to the established Federal policy of assisting the ship-building industry. In 1974-75, the Department of Transport administered grants to the Australian ship-building industry. These grants are made as compensation for cost disadvantages incurred in the domestic construction of ships. Responsibility for administration of the provisions of this Act has now passed to the Department of Industry and Commerce.

In practice, the Australian Shipbuilding Board approaches the relevant Minister with proposals to build specific vessels. If these proposals are approved, the Government commissions the works from shipyards registered under the bounty scheme. Upon completion of each project, the vessels are sold to those firms or individuals which originally ordered them. The difference between the price paid and the price charged for each vessel by the Government is absorbed as an approved subsidy. In 1974-75, the Commonwealth Government approved proposals for building 29 vessels, with resulting subsidies totalling $34.7m.

In addition to shipbuilding bounties, the Commonwealth Government also directs small subsidies and grants to shipping for various activities. For example, freight rates for wheat shipped to

Tasmania from the mainland have been subsidised for a number of years. Grants have also been made from time to time to assist port authorities in the improvement of their facilities. However, such payments have only amounted to relatively small totals in recent years.

Cost recovery targets are obviously not relevant to these distributive functions.

Australian National Line (ANL)

The Australian Shipping Commission operates vessels in the coastal and international trades as the Australian National Line (ANL). Under the Australian Shipping Commission Act 1974, ANL is required to function as a commercial enterprise and to pay dividends to the Federal Treasury. As with QANTAS and TAA, the implicit goal of ANL is therefore at least 100 percent cost recovery. However, in contrast to some previous years, ANL did not perform sufficiently well to return a dividend in 1974-75. ANL receives subsidies on particular routes in the coastal trades, and is currently given preference over private lines under the Australian Shipping Commission Act 1974.

State Government Activities in Sea Transport

Various State government departments and instrumentalities are involved with sea transport. These agencies generally have the functions of harbour boards, and most frequently actually operate on this basis. Their responsibilities cover the planning, development and operation of port facilities, channels, navigation aids and associated works. The Western Australian and Tasmanian governments have also operated vessels in their intrastate and interstate coastal trades in the past. However, these latter operational functions have declined markedly in recent years.

The various boards and other organisations engaged in these State government activities are charged with operating without losses. They often also have the requirement to finance their own investments, independent of Government assistance. In practice, however, they often receive both State and Commonwealth grants as well as receiving loans at concessional interest rates. They also frequently operate at deficits which are absorbed by State Treasuries.

ROAD TRANSPORT

The Federal Role in Road Transport

The Commonwealth Government's activities in regard to roads and road transport have a marked effect on the supply of and demand for road space. A number of Commonwealth Government Departments and Authorities perform a role within the road transport field. The Commonwealth Government is responsible for the provision, operation, maintenance and regulation of roads within the ACT and NT. In addition, it provides substantial grants to the States for the construction and maintenance of roads and bridges. It also operates bus services in Canberra and Darwin, and it has large fleets of vehicles to support the activities of the Commonwealth Public Service and the armed forces.

Responsibilities of the Department of Transport

The Department performs a policy and administration role in relation to roads. An important function is in the administration of the National Roads Act 1974 and the Roads Grants Act 1974, which provide financial assistance to the States by way of Section 96[1] grants. National Roads[2] comprise National Highways,

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(1) Section 96 of the Constitution of the Commonwealth makes provision for the Commonwealth Parliament to grant financial assistance to any State on such terms and conditions as the Parliament thinks fit.

(2) This was the situation under the 1974 Act. However, this was since changed, and the 'Export Roads and Major Commercial Roads' category has been replaced by 'National Commerce Roads'.

Export Roads and Major Commercial Roads[1]. The Commonwealth Government has accepted full financial responsibility for these roads, although they are largely constructed by the respective State road authorities. In 1974-75, the Commonwealth Government allocated $111.7m under the National Roads Act 1974. The States, however, are required to submit programs of projects annually for the approval of the Commonwealth Minister for Transport.[2]

Grants under the Roads Grants Act 1974 are for use on roads other than those defined as national roads, and are also for projects in the Minor Traffic Engineering and Road Safety Improvements (MITERS) program. Grants under this Act totalled $260.7m in 1974-75.

A third Act, the Transport (Planning and Research) Act 1974 covers Federal contributions to specific State transport planning and research activities, including the provision of two-thirds of the total of State contributions to the Australian Road Research Board (ARRB). The Department of Transport establishment also includes the Road Safety Branch and the Vehicle Safety and Standards Branch, which together co-ordinate Australian road safety studies, and perform other duties in relation to motor vehicle construction and safety standards.

The Department also administers the State Grants (Urban Public Transport) Act 1974, which provides two-thirds of the costs of approved programs of urban public transport projects. Such programs often include road transport projects (such as procurement of buses and establishment of busways).

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(1) There are 16303 kilometres of designated National Highways in Australia. A number of export and major commercial roads have been declared in the capital cities. Export roads have also been declared in Mackay, Townsville, Bundaberg, Wollongong, Port Pirie, Whyalla, Broome, Port Hedland, Derby, Windarra and Bell Bay.

(2) This procedure is understood to be under review.

Responsibilities of Other Federal Authorities

The Commonwealth Bureau of Roads (CBR) has as its prime function

> 'to investigate ... and to report to the Minister (for Transport) on matters relating to roads or road transport for the purpose of assisting the Government of the Commonwealth in consideration ... of the grant of financial assistance ... to the States in connection with roads or road transport'[1].

To this end, the CBR investigates and reports to the Minister on the present and recommended future levels of funding for roads.

The Department of the Northern Territory, the Department of Construction and the National Capital Development Commission are all involved in the provision of road infrastructure and its maintenance. In addition, the Department of the Northern Territory and the Department of the Capital Territory operate bus services within those respective Territories.

The Commonwealth Government, through its various Departments, operates a large fleet of vehicles which perform a significant ancillary transport task. The Department of Defence, the Australian Postal Commission and the Stores and Transport Branch of the Department of Administrative Services are three particular examples of organisations with substantial fleets owned and operated by the Commonwealth Government.

None of the roads functions described above as being associated with the Commonwealth Government have explicit cost recovery goals. With the exception of operations by the two bus services, all of these either have co-ordination or redistribution as their aim, or else they are ancillary in nature. However, the Commonwealth Government receives considerable revenue from transport operations through the usual taxing mechanisms, and

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(1) Commonwealth Bureau of Roads Act 1964, Section 14. It should be noted that the CBR has now been amalgamated with the Bureau of Transport Economics.

especially through its collection of excise on various fuels. This matter is dealt with in greater detail in later chapters of this report.

State Government Activities in Road Transport

All State Governments, except Queensland, own and operate road-based public transport instrumentalities which typically have large annual deficits although they attempt to cover costs. Cost recovery goals are not explicit for these services, although their stated goals may be to operate on a commercial basis. In practice, their deficits are absorbed or funded as a matter of course by State Treasuries.

State Governments are also heavily involved in funding and performing road construction and maintenance. The nature and scope of this involvement varies considerably both within and between States. In general, State Governments do not have specific cost recovery goals for roads infrastructure. However, there are occasional exceptions to this in relation to particular elements of the road system(1).

RAIL TRANSPORT

The Federal Role in Rail Transport

The Commonwealth Government, through the Department of Transport, is involved in the development of national rail policies. It also makes various types of grants to State railway systems, and it owns and operates railways through the Australian National Railways Commission(2). Nevertheless, there is no specific Federal cost recovery policy associated with rail transport.

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(1) For example, toll roads and toll bridges.
(2) Operating as Australian National Railways (ANR).

Responsibilities of the Department of Transport

The Commonwealth Department of Transport is responsible for advising the Minister for Transport on policy aspects of ANR's operations. Through the Rail Group of the Australian Transport Advisory Council (ATAC), it also assists in the development and implementation of national rail policies. Formulation of co-ordinated pricing policies and cost recovery objectives for rail has been raised at ATAC.

Grants to Railway Systems

The Australian Government makes grants to railway undertakings under the Australian Railways Act 1975 and the States Grants (Urban Public Transport) Act 1974. Amounts granted to ANR under the former Act must be repaid at such times and in such amounts as the Minister may determine. Interest is not payable on such grants. On the other hand, grants made under the States Grants (Urban Public Transport) Act 1974 are non-repayable. They are approved

> '... where a State Government proposes to carry out a project to improve the quality, capacity, efficiency and frequency of the public transport system of a major city...'[1].

Under the terms of this Act, the Federal Government provides two-thirds of the capital cost of such projects.

In 1974-75, Federal Government grants to urban railways projects totalled $17.7m[2][3]. Projects for which grants were approved included electrification of the Sutherland-Waterfall line in

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(1) States Grants (Urban Public Transport) Act 1974, Section 6(1).
(2) Department of Transport, Australian Transport 1974-75, Appendix 18.
(3) NSW Government, 1974-75 Report of the Auditor-General, pp. 38-9.

NSW, amalgamation of signal boxes on the Melbourne suburban rail system and provision of rolling stock for the electrified Christie Downs railway in SA. Cost recovery guidelines are clearly not relevant to Federal rail grants.

Australian National Railways (ANR)

The Australian National Railways Commission was established on 1 July 1975 to replace the Commonwealth Railways Commission (COMRAIL). Ostensibly, ANR's major policy objective is operation on a commercial basis. Therefore, at least full cost recovery is its implicit goal, but this is qualified in practice by constraints imposed upon it by some fundamentally uneconomic services which it is required to provide. Loss-making services are maintained and deficits continue to rise. These problems have been aggravated by the amalgamation of COMRAIL with the Tasmanian and non-metropolitan South Australian systems. Other constraints exist through pricing conventions such as the concessional fares which are offered to students and pensioners without commensurate reimbursement by the authorities responsible for general social welfare services.

The losses arising from such activities may be partially offset for ANR by the fact that it does not pay interest on grants made under the Australian National Railways Act (1975). However, ANR is required to pay a percentage of its capital to the Treasury in a manner similar to a dividend. The percentage is determined from year to year by the Minister for Transport. It is intended to be at a rate which can be reasonably expected from railway operations.

ANR therefore operates under the general government philosophy that users of government services should pay for the benefits which they enjoy. However, an explicit cost recovery policy does not apply to ANR.

State Government Activities in Rail Transport

The major objectives of the State railway systems as stated in their annual reports may be summarised as:

- Provide justifiable services, either in the economic or social sense;
- Create or maintain '...some semblance of financial stability...'(1);
- Optimise the use of equipment and resources; and
- Operate as commercial organisations responding to the needs of the market.

Implicit in these goals is the intention of attaining at least full cost recovery. Despite this, substantial deficits were recorded by the State systems in 1974-75. A major factor causing this situation was the requirement to continue operation of fundamentally uneconomic services. Other factors regarded as responsible included the high maintenance costs of obsolete equipment, restrictions caused by problems with oil supply in August and September 1974, labour stoppages, and inflationary cost increases. It should, however, be noted that these latter factors are also relevant to the consideration of recovery rates of all enterprises, both private and public.

Steps taken by rail enterprises to reduce their deficits include the withdrawal of some uneconomic services, particularly non-urban passenger trains. In addition, the losses arising from State systems are partially offset by the provision of subsidies and grants.

State rail enterprises therefore aim for full cost recovery, but tend to price their services on 'what the market will bear'. Such pricing is usually aimed at retaining or increasing the

(1) Western Australian Government Railways, Annual Report 1975, p. 3.

share of traffic, and is not necessarily related to the rate of cost recovery. An explicit cost recovery policy does not apply to all systems.

GENERAL COMMENTS ON FISCAL POLICIES

This brief survey of government fiscal policies in transport indicates that only two types of cost recovery goals currently exist. The first is the explicit goal of achieving 80 percent recovery of the costs of providing airports and airways by 30 June 1978. This is the only explicit and active cost recovery target in the public part of the transport sector of the Australian economy. Even this limited goal is now being held in abeyance pending further enquiries.

The second category covers the implicit one hundred percent cost recovery goal(1) applied by governments to their 'commercial undertakings'. For the Commonwealth Government, these include QANTAS, TAA, ANL and ANR. In practice, this implicit requirement is purely a legal formality. Governments at all levels frequently operate such organisations at deficits which are routinely absorbed in one way or another by the appropriate Treasuries.

Other fiscal measures and operations have either coordinating, redistributive or ancillary purposes, and are therefore not directly relevant to cost recovery.

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(1) Or such other goals as may be explicitly stated from time to time.

CHAPTER 3 - THEORETICAL AND PRACTICAL ISSUES IN COST RECOVERY

The fundamental purpose of virtually all forms of cost recovery studies is to attempt to detail the proportion of costs of providing services which is recovered from users and beneficiaries. In principle, this does not differ significantly from the basic aims of financial accounting exercises. However, any study of cost recovery over the whole of a particular field will inevitably run into problems caused by the complex interactions which occur between the many organisations and other elements involved.

Four main problems can be identified in carrying out such analyses. These problems are:-

- Attribution, which is the process of determining which costs and revenues are relevant to the activity concerned (which in this case is the provision of transport services);
- Allocation, which involves decisions on how to apportion attributable costs between the parts of that activity or the tasks being studied;
- Determination of capital values, which includes consideration of depreciation, interest rates and fluctuation of market values for particular assets;
- Assessment of intangible or non-pecuniary social benefits and costs.

A further significant element of cost recovery studies is assessment of the usefulness of the results of such studies for forming expectations necessary for pricing and investment decisions. This aspect was mentioned briefly in Chapter 1, and will be referred to in appropriate latter sections of this report. In particular, the usefulness of the results of the current study will be examined. The four problems outlined above are the subject of this Chapter, since they centre on important facets of the relevance of costs and revenues to specific services. Therefore, a suitable basis for treating these is necessary before specific results can be derived.

THE PROBLEM OF ATTRIBUTION

Attribution involves decisions on which incomes or revenues and which outgoings or costs can be rationally assigned to the activity under investigation. Accounts must be kept for legal reasons by all organisations, although the value and level of accounting varies according to whether the organisation's aim is to meet minimum legal requirements or whether it is to provide a comprehensive basis for other activities (such as price-setting). In theory, accounts can be kept systematically, so that operating costs and receipts can be attributed to particular activities undertaken by an organisation. The principal difficulty which arises in attribution exercises is not principally related to assessing general labour and capital costs and tracking revenues. Rather, it is encountered in deciding which taxes and subsidies can justifiably be included as costs and revenues respectively.

The usual arguments for and against attribution of specific taxes and subsidies centre around intent. If a tax was stated upon introduction to be (say) a direct charge for the use of infrastructure, or if it was hypothecated to the particular activity, then it would certainly be considered to be attributable. A similar situation applies if a subsidy is stated to be specific upon its initiation (unless, of course, the original specific purpose is lost in later developments). On the other hand, taxes and subsidies which are of a general nature are not usually attributed, on the basis that they are instituted for general revenue raising or income redistribution reasons. Furthermore, the issue is often confused. For instance a tax may be stated to be general, and may yet have a very direct impact upon users. Therefore, it could quite reasonably be perceived by many to be a user charge. Excise on motor spirits is often viewed in this fashion[(1)].

(1) For this particular case the problem in distinguishing real intent is compounded. The stated purpose of these customs and excise duties has always been revenue-raising but increases in 1926 were specifically introduced to finance the Federal Aid Roads Act. This specific purpose has since lapsed.

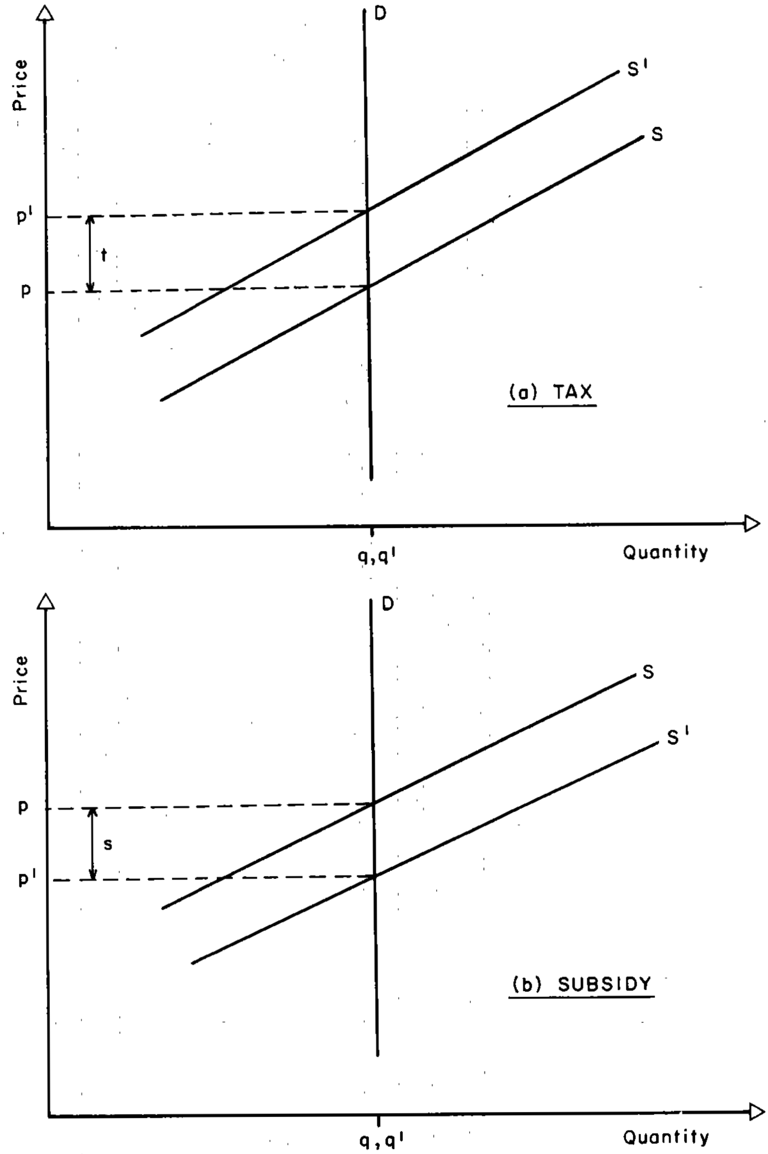
Attributions of taxes and subsidies based upon intent therefore often appear to be purely arbitrary. Consequently, they invite debate which is often of little value in clarifying the real issues. In practice, there is no sound basis for such definitive distinctions. Very few taxes are actually hypothecated to specific purposes. Almost all taxes and subsidies are respectively paid into and out of consolidated revenue.

General taxes and subsidies can be regarded simply as aggregated specific charges or payments for each of the range of government initiatives, levied in a general fashion for reasons of administrative economy. This statement on its own, apart from the issues covered in the above discussion, demonstrates that attribution based solely upon intent is not philosophically defensible. As a side-issue, this type of practice is not wholly uncommon in totally private-enterprise operations. Such enterprises often involve a degree of cross-subsidisation between activities for legitimate commercial purposes. As an example, the price of a particular motor vehicle model may well include components which relate to other activities of the company producing the vehicle (such as developing future models). Nevertheless, it would be pointless to assume that a purchaser is not attributing his total cost to the purchase of the vehicle.

An alternative approach to the problem of attribution involves the application of economic theory and statistical analysis through econometrics. All taxes and subsidies, regardless of their stated intent, affect the supply and demand for goods and services. This may occur directly, or it may come about inadvertently because of the interactive nature of the economy. Taxes and subsidies therefore directly change supply through their impacts upon the cost levels which producers must cover in order to reap profits and remain viable. They thereby influence output levels. The immediate effect of taxes and subsidies upon demand is twofold. Firstly, they change the levels of income which consumers have at their disposal and hence influence the extent of potential purchases and savings. Secondly, through their effects upon prices relative to disposable incomes, taxes and subsidies cause consumers to substitute some goods for others when making purchases. These impacts are best illustrated by two differing types of taxes. Production or consumption taxes or subsidies obviously affect the economics of production and hence result in changes in perceived supply characteristics. Alternatively, income taxes and welfare payments directly change the purchasing power of consumers and thus cause shifts in demand. Furthermore, taxes and subsidies (of both types) may also have secondary effects upon demand and supply respectively.

Because of these effects, any forms of taxes or subsidies are rarely borne solely by either producers or consumers. For this to happen, demand or supply characteristics must be very particular in nature. Examples of such cases are illustrated for production and consumption taxes and subsidies by Figures 3.1 and 3.2. The more usual situation of the effects of such taxes and subsidies being shared between producers and consumers is shown in Figure 3.3. It should be noted that production and consumption taxes only directly affect supply characteristics. For welfare payments and income taxes, however, the shifts occur in demand rather than supply, and the effects can be illustrated by the equivalent set of diagrams given in Figures 3.4 to 3.6. The full effects of welfare payments and income taxes are shared between all goods, services and savings, and therefore (in contrast to the effects of production and consumption taxes on supply) do not shift demand for any particular goods to the full extent of the tax or payment involved.

The diagrams introduced above are simplified representations of static situations involving only direct taxes or subsidies. In reality, a dynamic and more complex multiplicity of supplies and demands exists. Although the problem has been discussed in terms of producers and consumers, any particular producer/consumer relationship is simply a small part of the complex chain involved in delivering and employing transport services.

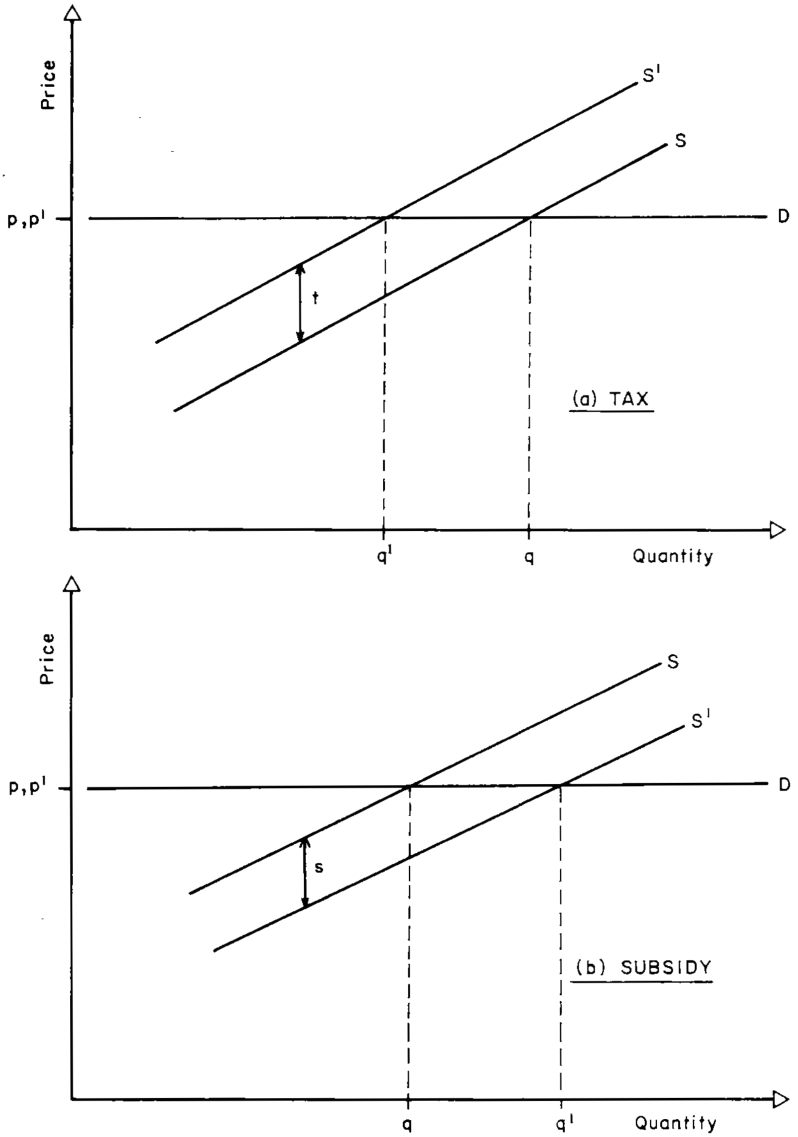


LEGEND

D	Demand (perfectly inelastic)	q,q'	Quantity before and after imposition of tax or subsidy
S,S'	Supply before and after imposition of tax or subsidy	s	Level of subsidy
p,p'	Price before and after imposition of tax or subsidy	t	Level of tax

FIGURE 3·1

EXAMPLES OF THE EFFECTS OF PRODUCTION OR CONSUMPTION TAXES (OR SUBSIDIES) FULLY PASSED ON TO CONSUMERS THROUGH PRICE (PERFECTLY INELASTIC DEMAND)

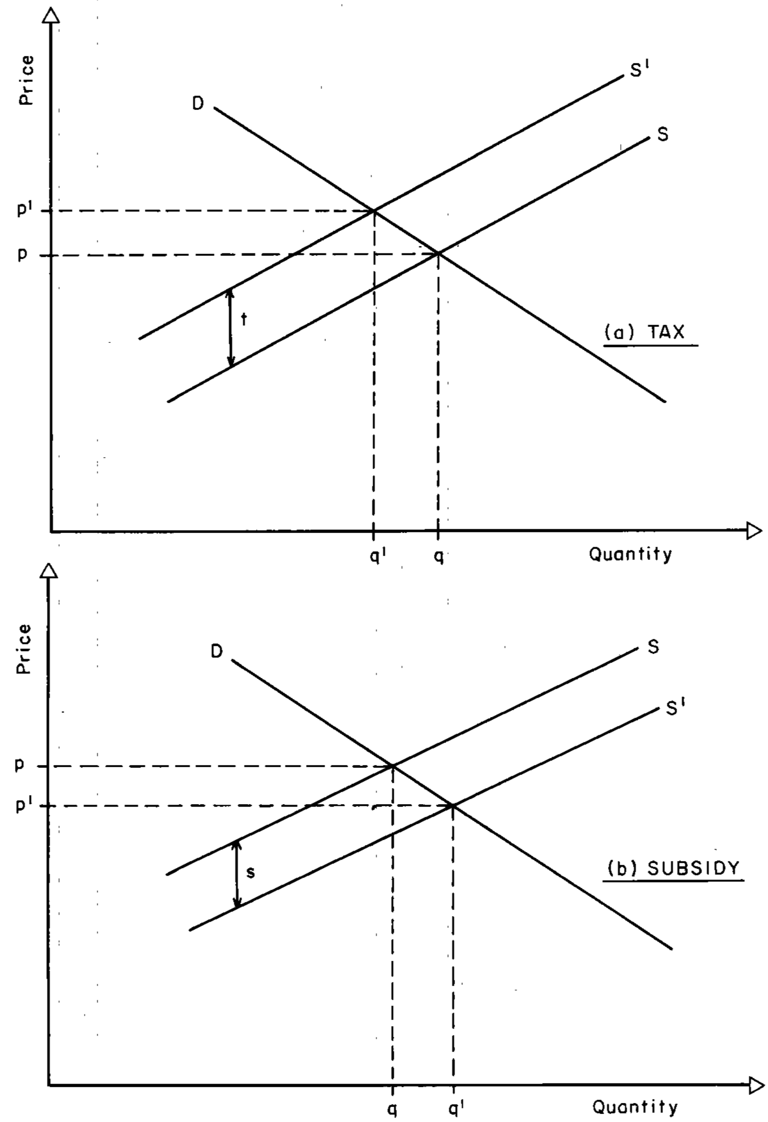


LEGEND

D	Demand (perfectly elastic)	q, q'	Quantity before and after imposition of tax or subsidy
S, S'	Supply before and after imposition of tax or subsidy	s	Level of subsidy
p, p'	Price before and after imposition of tax or subsidy	t	Level of tax

FIGURE 3·2

EXAMPLES OF THE EFFECTS OF PRODUCTION OR CONSUMPTION TAXES (OR SUBSIDIES) FULLY BORNE OR ENJOYED BY PRODUCERS THROUGH PRODUCTION (PERFECTLY ELASTIC DEMAND)

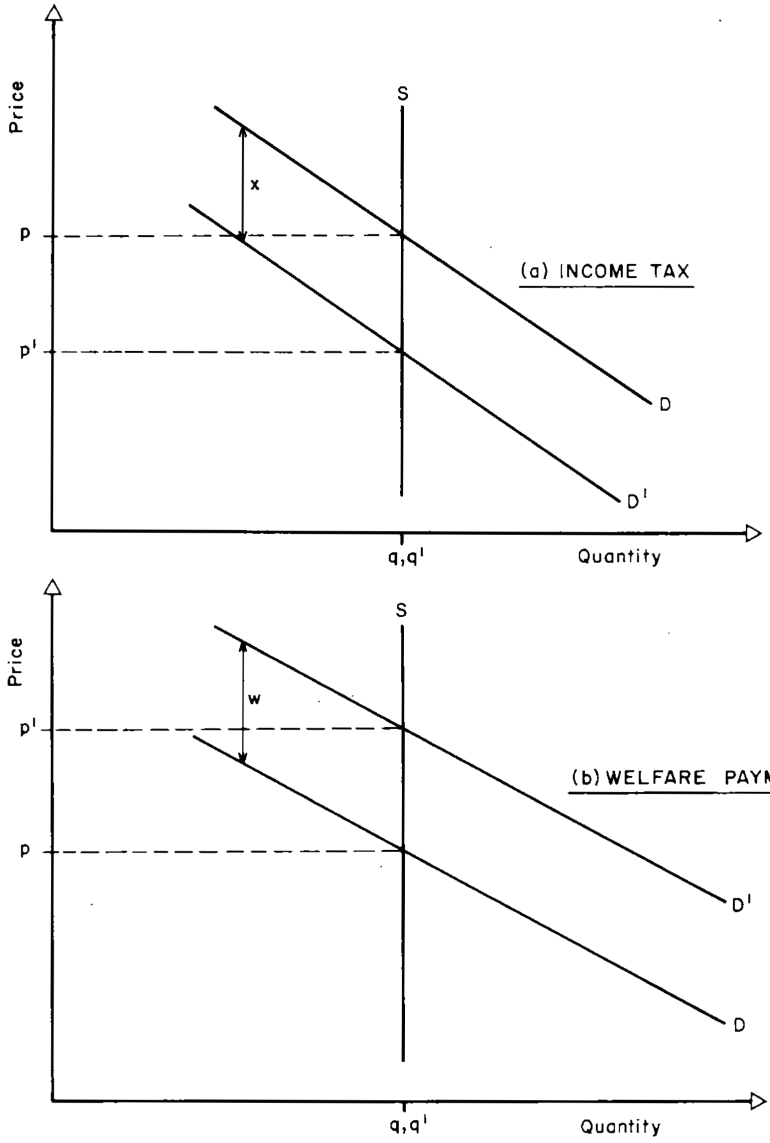


LEGEND

D	Demand	q, q'	Quantity before and after imposition of tax or subsidy
S, S'	Supply before and after imposition of tax or subsidy	s	Level of subsidy
p, p'	Price before and after imposition of tax or subsidy	t	Level of tax

FIGURE 3·3

EXAMPLES OF THE EFFECTS OF PRODUCTION OR CONSUMPTION TAXES (OR SUBSIDIES) SHARED BETWEEN PRODUCERS AND CONSUMERS (USUAL SITUATION)

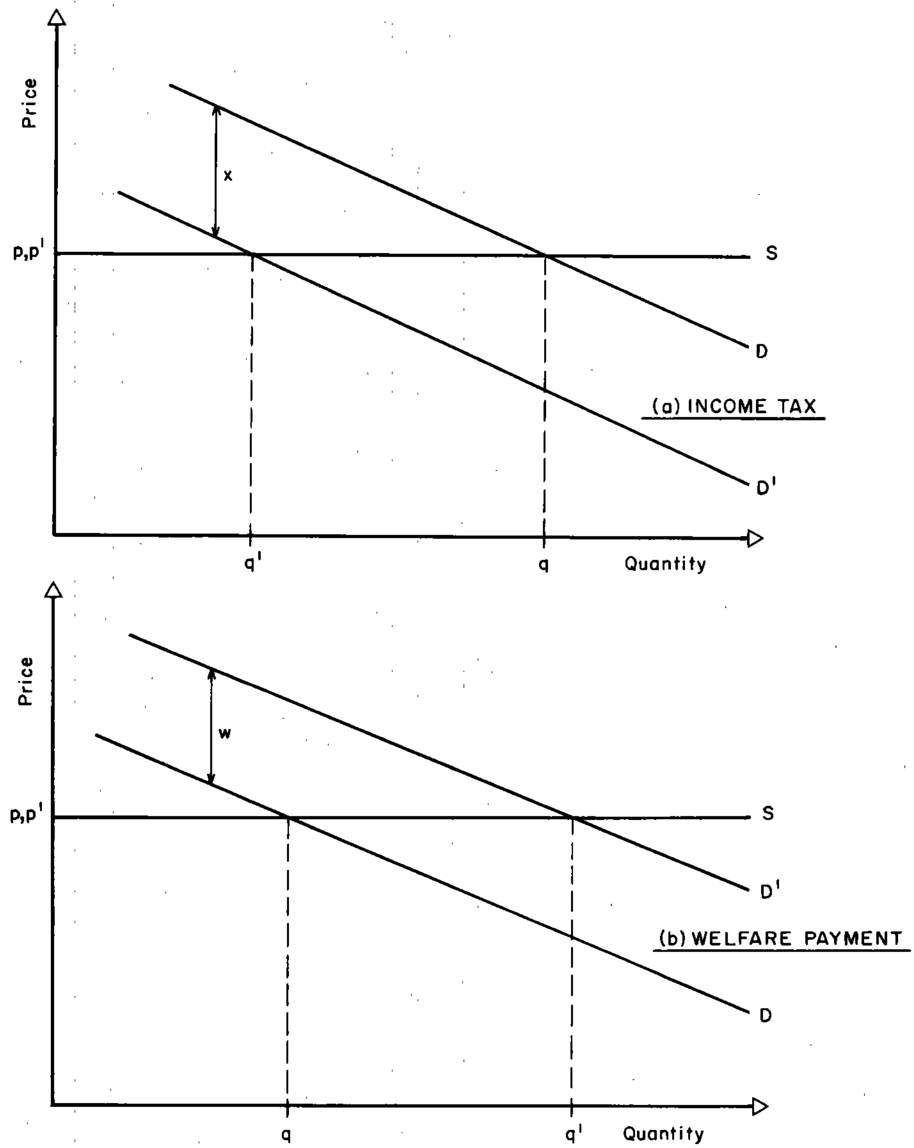


LEGEND

D,D'	Demand before and after imposition of tax or payment	q,q'	Quantity before and after imposition of tax or payment
S	Supply (perfectly inelastic)	x	Shift caused by income tax
p,p'	Price before and after imposition of tax or payment	w	Shift caused by welfare payment

FIGURE 3·4

EXAMPLES OF THE EFFECTS OF INCOME TAXES (OR WELFARE PAYMENTS) FULLY BORNE OR ENJOYED BY CONSUMERS THROUGH PRICE (PERFECTLY INELASTIC SUPPLY)

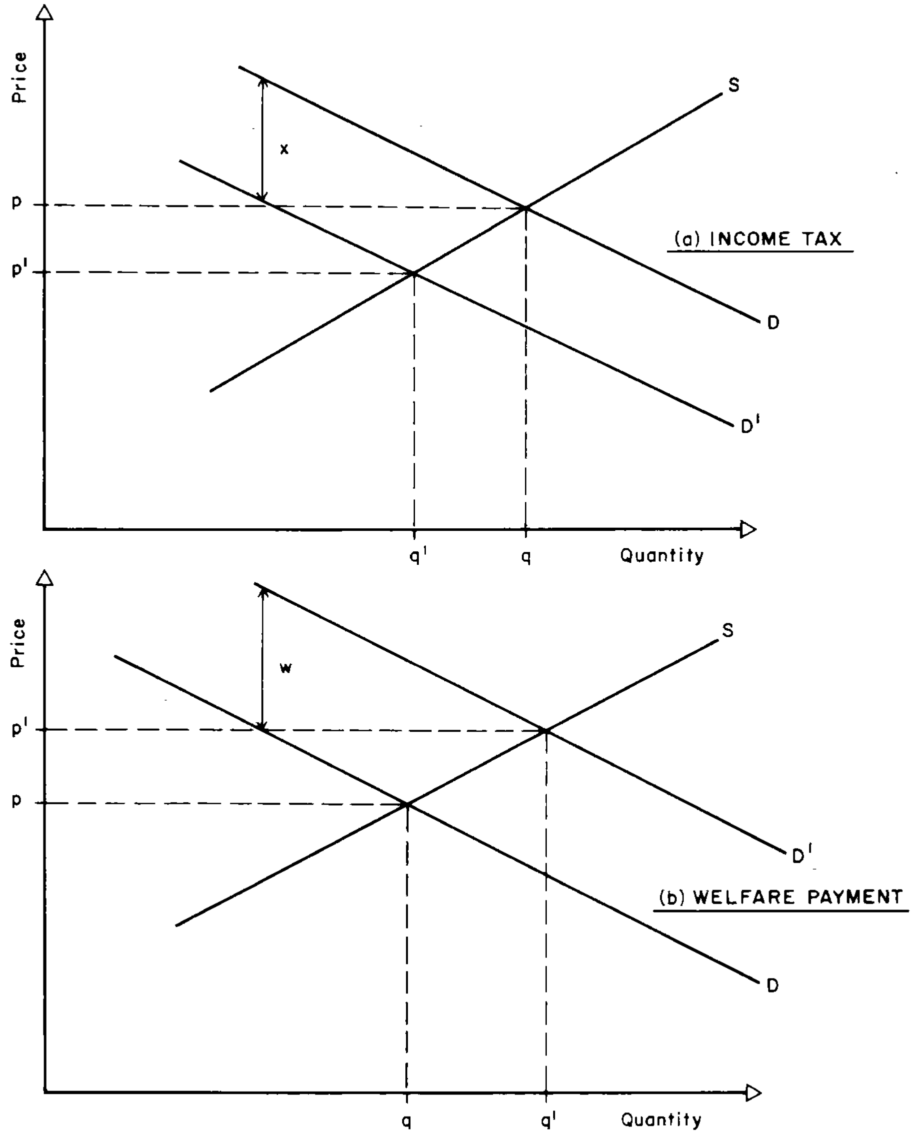


LEGEND

D,D'	Demand before and after imposition of tax or payment	q,q'	Quantity before and after imposition of tax or payment
S	Supply (perfectly elastic)	x	Shift caused by income tax
p, p'	Price before and after imposition of tax or payment	w	Shift caused by welfare payment

FIGURE 3·5

EXAMPLES OF THE EFFECTS OF INCOME TAXES (OR WELFARE PAYMENTS) PASSED ON TO PRODUCERS THROUGH PRODUCTION (PERFECTLY ELASTIC SUPPLY)



LEGEND

D,D'	Demand before and after imposition of tax payment	q,q'	Quantity before and after imposition of tax or subsidy
S	Supply	x	Shift caused by income tax
p,p'	Price before and after imposition of tax or subsidy	w	Shift caused by welfare payment

FIGURE 3·6

EXAMPLES OF THE EFFECTS OF INCOME TAXES (OR WELFARE PAYMENTS) SHARED BETWEEN PRODUCERS AND CONSUMERS (USUAL SITUATION)

Nevertheless, these diagrammatic representations are useful visual aids to understanding the major market effects. For this reason, these diagrams are discussed in some detail below.

Figure 3.1(a) shows a situation in which demand (D) for a particular particular product or service is perfectly inelastic. Imposition of a production or consumption tax (t, say) will raise the supply curve (as perceived by the consumer) from S to S'. The result will be that the price of the product or service will increase from p to p', with no change in the quantity delivered. Therefore, the full amount of the tax will be passed on to the consumer, with no effect on the producer. The complementary situation for application of a subsidy on production or consumption is shown in Figure 3.1(b). It should be noted that this situation would not normally be encountered in practice, since totally inelastic demand of the type shown in Figure 3.1 would not be found except in very special circumstances.

In Figure 3.2(a), the opposite situation is shown. With perfectly elastic demand (D), imposition of a production or consumption tax (t) will again raise the supply curve from S to S'. However, the price will remain unchanged, and the shift in the supply curve will be reflected in reduction of the quantity produced from q to q'. In essence, this means that the effect of the tax will be borne entirely by the producer, and will result in a scaling-down of his operation(1). Conversely, a subsidy applied to production or consumption of a product or service for which there is a perfectly elastic demand will result in an increased scale of operation with no change in price, as shown in Figure 3.2 (b). Again, these examples are unlikely to be encountered in practice.

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(1) This may or may not affect profitability, depending on the capability of the producer to adjust his operation to meet the changing circumstances.

The more usual situation is that shown in Figure 3.3(a). In this typical case, demand is elastic, but is not near the extremes of elasticity shown in Figures 3.1 and 3.2. Imposition of a production or consumption tax (t) will be reflected by an increase in price from p to p', while the quantity of the product or service consumed will drop from q to q'. Therefore, the effect of the tax will be shared between consumers and producers. Consumers will suffer an increase in price, while the producers' scale of operations will diminish. The reverse applies in the case of a subsidy, which is illustrated in Figure 3.3(b).

Corresponding diagrams are given in Figures 3.4 to 3.6 for the imposition of income taxes or welfare payments. In such cases, the effects of the taxes or payments are to alter demand, through changes in real incomes (and hence in the potential purchasing power of consumers). Thus, in Figure 3.4(a), an income tax will reduce demand from D to D'. In this case, with perfectly inelastic supply, the price of the goods or services involved will fall from p to p'. The corresponding situation with welfare payments is shown in Figure 3.4(b). Figure 3.5 shows the effects of demand changes caused by income taxes or welfare payments on production and prices of goods or services for which supply is perfectly elastic.

In Figure 3.6, the 'normal' result of the imposition of income taxes or welfare payments is shown. The effects of the change will be shared between producers and consumers. It should be noted that the shifts in demand in Figures 3.4 to 3.6 are <u>not</u> equal to the levels of tax or welfare payments applied, since these latter are shared between a whole range of goods or services. This is in direct contrast to the situation in Figures 3.1 to 3.3, where supply curves are shifted by the actual magnitude of the applied production/consumption tax or subsidy. The whole range of possibilities shown in these diagrams is summarised in Table 3.1.

TABLE 3.1 - EFFECTS OF TAXES, SUBSIDIES AND WELFARE PAYMENTS

Type of Tax, etc.	Nature of Supply	Nature of Demand	Result	Refer to Figure
Production/Consumption Tax or Subsidy	Usual	Perfectly Inelastic	Tax or subsidy fully passed on to consumer	3.1
Production/Consumption Tax or Subsidy	Usual	Perfectly Elastic	Tax or subsidy fully borne by producer through changed output	3.2
Production/Consumption Tax or Subsidy	Usual	Usual	Effects of tax or subsidy shared between producer and consumer	3.3
Income Tax or Welfare Payment	Perfectly Inelastic	Usual	Effects of tax or payment borne fully by consumer through changed price	3.4
Income Tax or Welfare Payment	Perfectly Elastic	Usual	Effects of tax or payment fully borne by producer through changed output	3.5
Income Tax or Welfare Payment	Usual	Usual	Effects of tax or payment shared between producer and consumer	3.6

The extent to which the effects of taxes or subsidies are shared between producers and consumers clearly depends on the slopes (and hence elasticities) of the supply and demand curves. In principle, it should be possible to estimate the effects of sharing using econometric methods. However, such estimation is dependent on the availability of suitable methods to determine the relevant supply and demand functions and on the information available. If such constraints are met, the extent of sharing of taxes and subsidies can be calculated. However, such an approach is usually not practicable because of data and resource constraints. Also, if the process is not carried out exhaustively and meticulously it may be fraught with error for the following reasons:

- The effect of shifts in supply and demand are rarely contained in single markets. All goods and services have substitutes or complements to a varying degree, and these must be taken into account when specifying the supply and demand functions. However, because of imperfect knowledge and the possible far-reaching repercussions of rapid market changes, such as those associated with sudden removal or initiation of taxes and subsidies, selection of variables and specification of mathematical forms of the models of supply and demand functions can never be perfect. On these grounds alone, the types of determinations discussed above must be subject to error;

- Information is not usually collected for the sole purpose of estimating specific supply and demand functions, but rather is obtained for some other (more general) purpose. This difference of intention results in data being indicative, rather than being the result of actual measurements of the variables concerned. Furthermore, collection, editing, processing and printing of data all inevitably result in errors which compound the discrepancies generated by the initial difference of purpose. Inherent data errors therefore also lead to less than perfect determinations of market behaviour;

- Because of the problems discussed in the previous two points, supply and demand functions cannot be determined precisely. Econometric methods must be used to derive estimates, and the accuracy of the results of such methods must be gauged by statistical inference. The latter processes can be used to indicate the probabilities that the results of a particular analysis are within certain ranges of the actual or 'true' function. Nevertheless, since the 'true' function itself is not known, such inferences are in turn subject to error. Apart from differences in model structure, variable choice and mathematical form, various estimates of the same function using different data bases will yield ranges of results which may be wide or narrow. Under such circumstances, selection of the most appropriate estimate is largely a matter of judgement. Obviously, the more estimates available and the narrower the range between them, the easier it becomes to make such judgements;

- Econometric theory prescribes methods of estimation which are based on restrictive assumptions concerning the degree of correlation between the errors in the variables used. The simplest form of statistical techniques assume away all such problems. Methods have been devised to take each type of breakdown of these assumptions into account. Such methods are also available for some combinations of these breakdowns. However, research has shown that when a multiplicity of data problems arises, the simplest forms of estimation techniques most usually yield the more accurate results. However, as discussed above, these are inherently erroneous and single estimates may therefore not be sufficient to determine attributions involving large government expenditures.

The complexity of economic interactions in any economy, and the errors inherent in econometric estimates of such relationships, require that such estimates should be carried out by highly professional staff. They also involve the use of considerable resources (including time). The complexities of identification and quantification of such relationships often preclude such tasks, as do limitations on resources such as staff, computer services and so on. Consequently, arbitrary assumptions must necessarily be made concerning the level to which the analysis will proceed, and the way in which taxes and subsidies are shared at that level so that attribution can be carried out. There is no alternative to such an approach if all the necessary information is simply not available.

For these reasons, it is necessary to make certain assumptions regarding attribution in this cost recovery study. It has been estimated that transport contributes 25 percent of Australia's total output of goods and services if both ancillary and 'final' transport operations are taken into account. Hence, impacts of the transport market upon the total economy are likely to be large and far-reaching. It is therefore very difficult to trace the effects of transport taxes and subsidies throughout the economy and to determine their implications for cost recovery.

Very little research along these lines has been carried out in the past. That which has been completed has been largely based on the availability of information which is relatively sparse. On the supply side, the major internal information requirements of private firms and government instrumentalities are geared toward taxation obligations, day-to-day management needs and the production of annual reports, rather than towards economic analysis. Such organisations therefore do not keep highly itemised financial records or comprehensive details of their operations. Furthermore, firms and instrumentalities are often rather unwilling to supply detailed information for security reasons, since this information could be used to advantage by their competitors.

On the demand side, little detailed information exists concerning the consumption of transport services, especially in the private motoring area. Possibly for this reason, only very limited research has been carried out concerning the income distribution effects of transport(1). Hence the effects of taxes and subsidies which influence demands for transport services (as opposed to supplies of these services) are even more elusive.

Taking these considerations into account, it is obviously necessary to limit the cost recovery analysis in this Report to the 'supply' side of the situation. This must be done at each link in the chain of producers and consumers involved in delivering transport services. As an example, if the Department of Transport is regarded as a supplier of services to the aviation industry, cost recovery for the Department is estimated by examining its costs and revenues. Correspondingly, cost recovery for the aviation industry (as a supplier of services to the final consumers) is derived by examining the industry's costs and revenues. Therefore the process of attribution in this Report is based on an ex-post investigation of costs and revenues for each group of suppliers of transport services. Those taxes and subsidies which directly affect supply are included in the analysis. However, the more general taxes and subsidies which cause shifts in demand are not included.

While this convention has been adopted throughout this analysis on the grounds that it is really the only satisfactory option available, it should be pointed out that it does lead to some notional distortions. Reference to Figure 3.3 will show that the effects of a production/consumption tax or subsidy are usually shared between producers and consumers. An ex-ante analysis of the projected impact of such a tax indicates that it is borne in part by the producer through lost production, while part of it is borne by the consumer through price increase. However, a subsequent investigation of the producers' costs and revenues for the period under consideration would not clearly show this position. The effect implies that there should be a negative entry on the revenue side of the cost recovery 'balance

(1) Some Australian work in this area is described in: Bentley, P. et al, The Net Fiscal Impact of Roads, Fourth Conference of Economists, Canberra, August 1974.

sheet'. This will no doubt affect the accuracy of cost recovery calculations, but the problem should be relatively minor in most cases (depending on the relative magnitude of changes in cost structure during the period under consideration).

Furthermore, the effects of income taxes and welfare payments will be passed on to producers through shifts in demand. Since direct expenditures by most individuals on transport services form a small proportion of their budgets, this may not be a significant factor in estimating historic cost recovery levels. However, it could be important in assessing potential effects, if changes in cost recovery policies are envisaged. Again, lack of substantial information on this topic forces acceptance of this approach.

THE PROBLEM OF ALLOCATION

Once the costs and revenues which should be attributable to transport services have been determined, it is next necessary to allocate costs and revenues between individual tasks or groups of tasks. Allocation problems arise for two reasons. The first is that even though financial records must be kept by all organisations in response to legal requirements, revenues and costs are rarely dissected on a sufficiently appropriate or detailed basis to permit the use of such accounts without further allocation. The second reason is rather different, but it at least partly explains the first. Transport services are often produced jointly. For instance, virtually all vehicles can carry both freight and passengers, and the appropriate breakdown of operating costs between these services is a difficult question. Such costs are common to both freight and passenger services, but cannot be directly associated with either in any way.

One way of dealing with joint costs is suggested by economic theory. Multiple-output production functions, coupled with derived input demand functions and the dual cost function, could be used to estimate the cost of each input appropriate to each service at the prevailing level of service[1]. The models employed in carrying out such estimates necessarily contain the implicit assumption that production functions, derived demand functions and cost functions remain constant for the data set used in the analysis. Of necessity, the basic data for such models must be drawn either from cross-sections of numbers of operations or firms, or over considerable periods of time for a single enterprise. The implicit assumptions of constant production derived demand and cost functions rarely hold under such circumstances. Consideration of the actual behaviour of firms indicates that input and product proportions do not seem to be varied in a continuous fashion, but rather change by discrete movements in response to changes in climate, technology, government initiatives and other deterministic, stochastic or random events. Outputs therefore tend to be produced in unique sets.

Adoption of this formal econometric approach is further limited by data problems. The information required for such studies is necessarily detailed, and is not usually readily available. Hence, such formal analyses are rarely possible in practice. Finally, because of the inherent errors associated with statistical estimation and inference (discussed earlier in relation to attribution of costs and revenues), the results of such studies may be misleading unless they are confirmed by alternative analytical processes. For these reasons, allocation of costs and revenues to different services is therefore usually undertaken on an arbitrary though intuitively acceptable or attractive basis, such as by throughput in terms of weight or volume.

Due to the lack of sufficiently refined and comprehensive information on the economic characteristics of the Australian transport systems, arbitrary methods have had to be adopted in this study.

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(1) An example of this type of approach is given by: Hasenkamp G., A Study of Multiple Output Production Functions, Journal of Econometrics, 4 pp 253-262, 1976.

Such methods have been established at various levels of detail, depending upon the availability of data. The allocation processes for the air mode are based upon Department of Transport analyses, which are carried out in a detailed fashion at an intensive level. On the other hand, very broad assumptions concerning allocations have often had to be applied at highly aggregate levels for the other modes, because of a lack of data other than that shown in annual reports. For this reason, comparisons of the results obtained for different modes are not necessarily valid on consistency grounds alone. The basis used for allocating costs and revenues for each part of the study is described in the appropriate sections of this report.

DETERMINATION OF CAPITAL VALUES

Before the impact of methods of determining capital values can be assessed, it is necessary to examine the reasons for particular investment and disinvestment decisions. Essentially, such decisions reflect expectations of future benefits which will result from a rearrangement of current capital holdings. These decisions must be based on current replacement and acquisition costs of existing and potential future assets, since no viable alternative yardstick is available. Markets for new and used capital goods could not exist without this situation. It can be assumed that investors have varying expectations of future yields at any point in time. Therefore, some will wish to sell while others desire to acquire, given that they can do so at prices suitable to their individual budget constraints. Therefore, in theory, capital values and hence interest on capital and depreciation charges, should be based upon current market prices.

However, this approach cannot be adopted for most transport infrastructure and transport equipment in Australia. The problem is that active markets for goods such as airports or railway rolling stock do not exist. Salvage values are similarly inappropriate in most cases, since they do not represent market concensus values of resource flows in use. Exceptions to this are encountered when the assets concerned are redundant and their actual abandonment is a real alternative. Except in these latter (and very rare) circumstances, appropriate capital values for transport infrastructure and equipment cannot be determined by normal mechanisms, but must be estimated on a basis which necessarily employs arbitrary assumptions.

Yet another distorting factor is the effect of imperfect competition. Purely competitive conditions include perfect information flows. If these conditions apply, the discounted future net benefits from a facility are equal to its net worth or current capital value. Benefit-cost analysis is a variation of this approach, and is based on expectations of future revenues and costs. This analytical technique is widely used by governments to assess the desirability of potential investments. In theory, it may also be used to assess the sum which a commercial enterprise would be prepared to pay to acquire a new undertaking.

Nevertheless, this approach is not fully tenable in assessing capital values. The reason for this is that operational and other changes which a commercial organisation would be likely to introduce must be taken into account when making such estimates. Information flows are not perfect, and hence the vagaries of human nature, markets, governments, technological developments and the environment assume importance. These ensure that no two organisations would formulate expectations similarly, and they would therefore be most unlikely to assess any particular asset as having the same capital value. Furthermore, there are problems involved in assessing intangible costs and benefits and allocating joint costs and revenues. These problems would place any such result in doubt as a true measure of the value of the capital resources involved in a particular asset.

The use of historic costs depreciated for age is not a theoretically appropriate method to apply, since market forces and hence prices change over time. Historic values will therefore not reflect current resource flows. The use of historic values as inputs to investment decisions (as indicators of current resource flows) is likely to promote inappropriate allocations of resources.

Similarly, the use of replacement costs depreciated for age is not theoretically appropriate if technology has changed over time. Such values will reflect the higher efficiency of modern equipment rather than the resource contributions of the aged and technically out-of-date equipment.

The net result of this is that there are no practical means of accurately assessing the levels of current capital stocks or flows for most transport infrastructure and transport equipment. Any estimates must therefore be based upon arbitrary assumptions. The more recent the relevant investment, the more accurate estimates based on such assumptions are likely to be. The problems which have been referred to above are obviously exacerbated by high rates of inflation, unstable domestic and foreign markets and rapidly shifting shares of production and consumption between sectors of the economy. All these factors tend to cause most price relativities to vary rapidly over time. Especially, they cause rapid shifts in the values assigned to capital goods, because of the 'accelerating' effects of changing expectations upon the prices of such goods.

In reality, therefore, actual levels of cost recovery in resource value terms are indeterminate, if only because it is impossible to include prescriptive assessments of the costs and revenues which could appropriately be applied to the use of capital equipment. The problem is to choose methods of valuation which are intuitively reasonable and generally acceptable. No such method can be regarded as wholly accurate. So that the effects of varying the basis of capital valuations can be demonstrated, three quite distinct methods have been applied in this study.

Historical Cost Method

The first method is based on the historical cost of capital equipment depreciated for the age of the equipment. This approach is considered because (by convention) it is applied in current cost recovery policies and is adopted by commerce despite the 'inflation accounting' controversies of recent years. This method is basically aimed at assessing how past investments have paid off. It does not show whether or not current capital resource flows are being recovered by revenues.

Indexed Historical Cost Method

The second approach involves indexing historical costs forward prior to depreciating them, so that historical costs are expressed in current money values. This approach takes the effects of inflation into account, but it does not make allowances for changes in technology and changes in the balance of capital equipment stocks over time. However, it is intuitively more satisfactory than the basic historical cost approach.

Incurred Capital Cost Method

The third criterion of cost recovery used in this study excludes imputed capital costs of any form and only includes those capital costs actually paid or set aside. This third approach has a rationale of its own. In the short run, firms are viable as long as they cover operating costs. These normally include interest actually paid on borrowings, rents paid and reserves set aside for replacements (as opposed to new acquisitions) of plant, equipment and so on. The first two items relate to interest on capital, while the latter is broadly equivalent to depreciation. Since markets do not exist for many assets used in the transport sector, construction and acquisition costs can often be regarded as sunk and irretrievable. This situation makes any decision to operate services which use such assets a short-run consideration, in the sense that some assets are necessarily fixed. Such assets will only be abandoned or redeveloped if they become redundant, or if more desirable alternative uses for them (or at least for part of them) evolve over time. Hence the economic viability of such operations is only dependent upon receipts covering operating costs. Sophisticated imputations of capital costs are therefore irrelevant. The implications of this approach for the current study are that only operating costs are considered, with capital costs being ignored on the basis that they are sunk and irretrievable, and hence are irrelevant to the viability of operations. However, operating costs are augmented to include actual interest payments and provisions for future renewal of assets (as opposed to new investment).

Use of the Alternative Methods

Each of these alternative approaches has been used in calculating cost recovery levels in this Report. Full details of the actual techniques used in particular cases are given in the related sections, with appropriate references to the actual analysis of capital values in Annex A.

SOCIAL COSTS AND BENEFITS

The benefits of transport accrue to the whole of society. They are not isolated to users or direct consumers of transport services. In addition to its value in enabling trade and migration, transport also generates welfare spinoffs to society through (for example) its involvement in defence and emergency services such as ambulance movements. In many respects, therefore, transport resembles a public good. Public goods in an economic sense are those which are consumed by all, and which are never scarce in the sense that consumption of such goods by each individual does not affect the consumption and satisfaction derived by others from the same goods. An example of a pure public good is national defence preparedness.

The majority of transport services are of an ancillary nature. They can therefore be categorised mainly as intermediate goods, the demands for which are largely derived from those of other goods and services. Therefore, according to Marshall's principles of derived demand[1], the demand for transport will be relatively unresponsive to changes in price, especially in the short term. Producers of transport services may therefore be able to command higher prices and profits by restricting their output. In the longer run, however, competition between producers of transport services and substitution by consumers of other inputs for transport may reduce producers' ability to act in this fashion. For example, land and capital may be substituted for transport services through factory or warehouse relocation.

A further aspect is that the large size and lumpiness of investments in much transport infrastructure and the consequent high proportion of fixed costs in transport services, result in firms or instrumentalities experiencing decreasing unit costs as their operations expand. This comes about because the physical transport capacities provided by appropriate minimum increments of investment are usually quite large. In turn, this ensures that the facilities provided by such investment are protected from competition because it is unlikely that they will be duplicated in the same geographic area. Even while such facilities operate at less than full capacity, they are usually natural monopolies. Hence, operators of such facilities can reap excess profits by witholding supply and driving up prices. Economic theory demonstrates that such operations must be subsidised or protected in some way to ensure that they provide a level of service commensurate with society's needs. The subsidisation or protection need not be permanent. There are numerous examples overseas of (say) congestion at airports which are operating well beyond 'full capacity', and hence experiencing a reversal of previous decreasing-cost situations.

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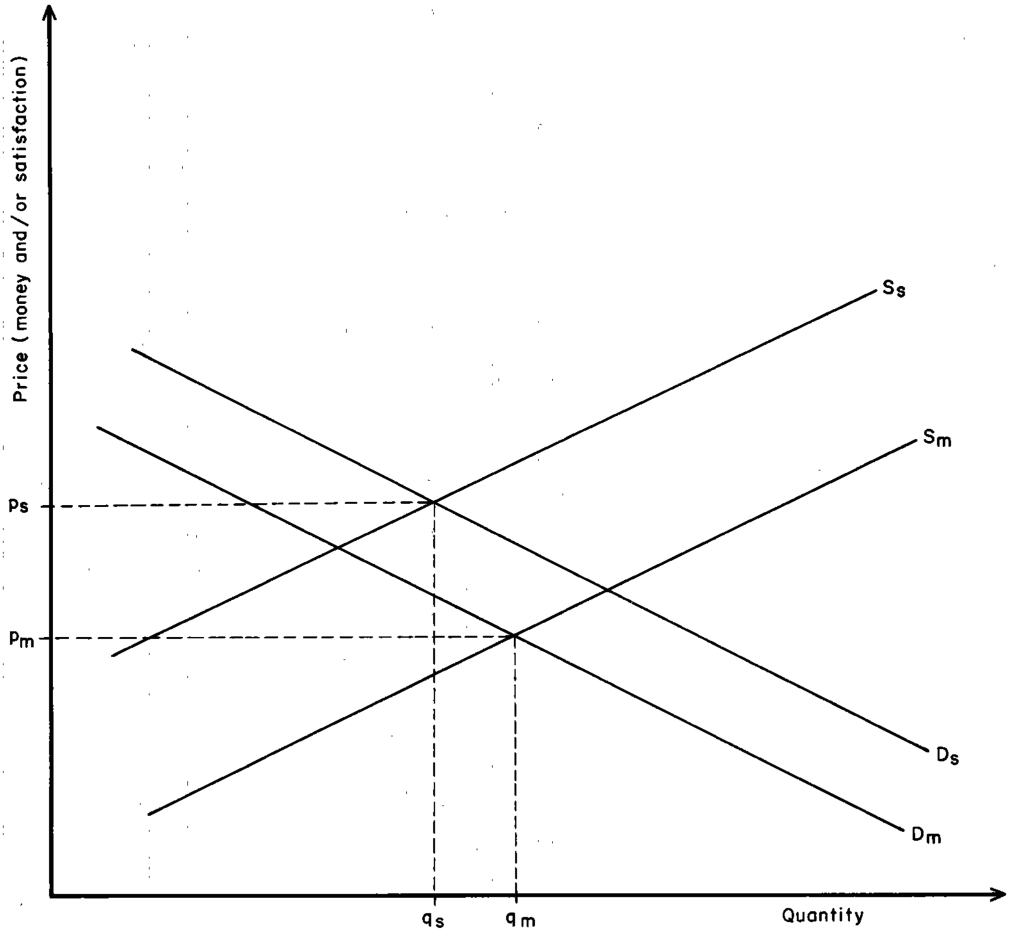
(1) Friedman M., Price Theory: A Provisional Text, Aldine Publishing Co., Chicago, 8th Printing, Chapter 7., pp 148-161.

A further characteristic of transport is that it permits the spatial mobility of resources (including human ones) and goods and services. Because there are geographical differences in welfare, transport can therefore have a marked impact on welfare distribution.

Externalities

The characteristics of transport mentioned above are widespread. Their eventual effect is that transport is likely to attract considerable public attention, which in turn will result in government intervention in transport markets. These factors justifiably result in transport operations being taxed, subsidised and regulated to achieve social goals either in addition to or in place of commercial goals. In other words, society pays costs and receives benefits related to transport in non-pecuniary or intangible ways. These 'social' costs and benefits are additional to those which are valued financially by market activities. The result is that the appropriate operating point for a particular transport service may be quite different from that which would be derived by strict commercial activity. This situation is demonstrated simply in Figure 3.7. Although this representation is static and therefore can only be regarded as approximate, it illustrates a number of issues which are important in relation to cost recovery policies.

For a good with no welfare spinoffs (or 'externalities'), the money which changes hands in the market compensates fully for the satisfaction lost or gained by suppliers and consumers respectively. For such goods, the supply and demand curves for the market and for society are therefore synonymous. In reality, it is doubtful whether any such goods or services actually exist, as all goods and services tend to have at least one positive or negative externality associated with them. For instance, all transport services generate noise. Also, by virtue of scheduling or congestion, they usually involve waiting costs from time to time. On the other hand, the same services also provide contri-



LEGEND

D_s Demand (social factors included)
D_m Demand (social factors excluded)
S_s Supply (social factors included)
S_m Supply (social factors excluded)
P_s Price (money plus satisfaction)
P_m Price (money only)
q_s Quantity (social factors included)
q_m Quantity (social factors excluded)

FIGURE 3·7

SUPPLY AND DEMAND FOR TRANSPORT SERVICES WITH PUBLIC GOOD ASPECTS butions to national defence preparedness, and they ensure that facilities are available to the bulk of the population in emergencies. The transport sector and society are not directly compensated or taxed through the market for any of these positive or negative spinoffs repectively. Compensation transfers are the role of government in such cases.

In Figure 3.7, the market supply and demand relationships for a particular good or service in purely monetary terms are shown by S_m and D_m respectively. However, the 'social' supply and demand relationships (that is, those including both monetary values and the appropriate externalities of the type mentioned above) are shown by S_s and D_s. The net result of this is that two distinct equilibrium conditions may be defined. The first (described by q_m and p_m in Figure 3.7) is that which would prevail if only the normal market (i.e. monetary) characteristics were taken into account. The second condition is that described by q_s and p_s in Figure 3.7, and is the situation which would be encountered if the appropriate social characteristics of the supply and demand relationships were included. In fact, markets for all goods engender complex variations of the situation described in Figure 3.7, and this can have implications in determining appropriate levels of cost recovery. This characteristic will be mentioned later. However, it is probably valuable to comment at this stage that circumstances can be encountered in which even large externalities in both supply and demand need not cause changes in the quantities of goods or services actually supplied.

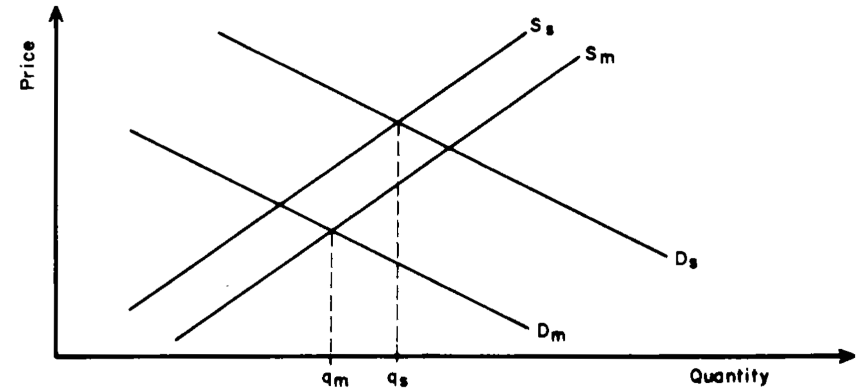
Application of Political Processes

The value of net welfare benefits or costs cannot be measured objectively, but rather must be assessed through the political process in a subjective fashion. Social, political and budgetary factors and levels of services must be simultaneously traded off against each other. This is a major role of the political process. Consciously or otherwise, governments assess the relative priorities and sizes of social net benefits as they are influenced by political factors. However, the political role is not confined to social aspects. It can also involve more directly economic factors, through such mechanisms as imposing constraints on the financial performance of government instrumentalities. However, this particular political role (as opposed to that of assessing social implications) actually appears very similar to that of the management of commercial organisations.

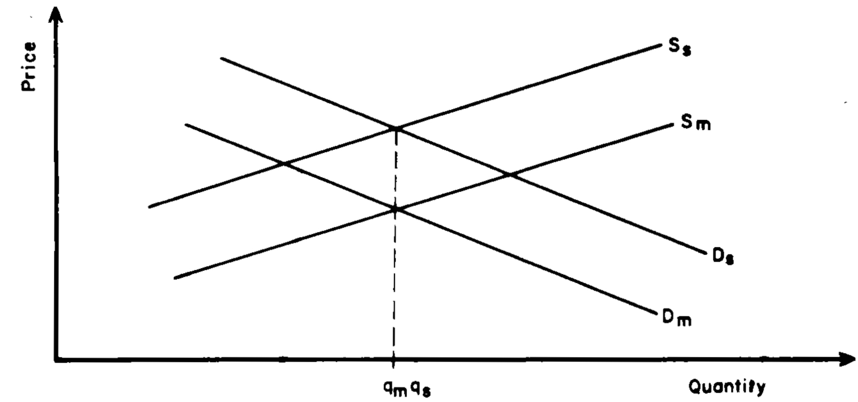
In essence, the political process covers two roles regarding transport services. The first is that involved in setting appropriate social goals, while the second is a fairly typical economic role. By definition, the first role is the sole province of the political system, and is therefore not amenable to objective analytical investigation. For this reason, no attempt has been made to evaluate intangible social costs and benefits in this study. The analysis has been carried out purely in terms of monetary markets for goods and services and does not specifically take into account the interface with the political (or 'social') market. The latter market cannot be ignored, however, as it exists in democratic societies as a means of moving towards equilibrium between the social demands and supplies illustrated in Figure 3.7. This discussion has substantial implications for cost recovery studies. The major one is that more or less than 100 percent of the financial costs of providing services can be legitimately recovered, depending upon the extent of net social costs and benefits. Budgetary limitations must of course be taken into account in arriving at such goals, but the extent of net social benefits is necessarily the overriding factor. Typical situations, and their cost recovery implication, are demonstrated in Figure 3.8.

<u>Deficient Markets</u>

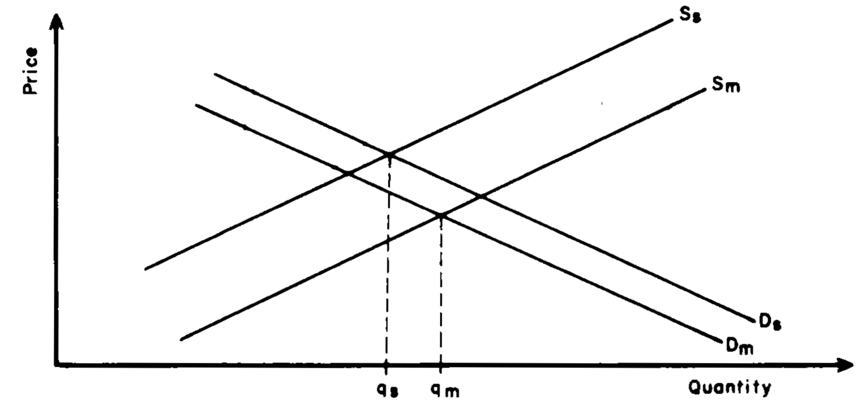
One common situation is that illustrated in Figure 3.8(a). In this case, the particular levels of externalities dictate that the supply of goods or services derived from monetary market conditions is rather less than that which would be encountered if



(a) Deficient market ($q_m < q_s$) - less than full cost recovery warranted



(b) Appropriate market ($q_m = q_s$) - full cost recovery warranted



(c) Excess market ($q_m > q_s$) - greater than full cost recovery warranted

Legend for this Figure is as for Figure 3·7

FIGURE 3·8

THE EFFECTS OF SOCIAL AND MONETARY SUPPLIES AND DEMANDS ON COST RECOVERY JUSTIFICATION the externalities were included. The market could thus be regarded as 'deficient', in the sense that monetary considerations would lead to less consumption of the goods and services than would be considered desirable in a social sense. This would be a case in which less than full cost recovery would be warranted, since full (or greater) cost recovery would lead to an operating condition even further from the appropriate social equilibrium.

Appropriate Markets

In Figure 3.8(b), the monetary and social equilibrium conditions result in an identical output of the particular goods or services. This situation was foreshadowed in an earlier point related to the general relationship between social and monetary markets. It is an example of a case in which full cost recovery would be warranted.

Excess Markets

On the other hand, Figure 3.8(c) shows a situation in which the output under social equilibrium exceeds that under monetary equilibrium. This could be regarded as an 'excess' market, and would be an appropriate situation in which to apply greater than full cost recovery. It should be noted that the three situations shown in Figure 3.8 are only specific examples from a wide range of possibilities. The three outcomes shown can occur as a result of various levels of both positive and negative externalities.

Cost Recovery Mechanisms

The appropriate level of cost recovery need not be achieved only by direct charges or direct payments. Indirect methods such as general taxes, tariff barriers and arbitrary regulation of services can be used to achieve the desired level of output. In strict economic terms, direct charges and subsidies for each spinoff are favoured. However, this would lead to a multiplicity of charges which could be economically impossible to administer, since the cost of collection could frequently exceed the revenues brought in by the charges. Nevertheless, it is desirable that the transfers should be made as overt (as opposed to covert) as possible. This is necessary to ensure that the appropriateness of policies can be gauged readily from public reaction. This, in turn, enhances the possibility of bringing about adjustments which will improve social welfare in a timely fashion. Direct charging systems therefore reinforce the government role of balancing social and economic activities, as they heighten responsiveness to changes in social factors.

SUMMARY OF COST RECOVERY STUDY THEORY

The previous discussion has covered the four major philosophical problems encountered in carrying out cost recovery studies. In each instance, it was concluded that the 'true' position could not actually be determined, and that a set of arbitrary assumptions had to be chosen on rational pragmatic grounds. Further, it was regarded as essential that the study should consistently adhere to this set of assumptions.

In each instance, the basic problem encountered was insufficient data. In some cases, the information required had not been collected, while in other cases the information had been collected but was unreliable. However, some categories of information are quite literally unobtainable, in the sense that the variables involved could never be measured since they are intangible. Such problems are virtually always encountered when undertaking economic, social and political research. They can often be overcome through intensive collection and pre-analysis of data, or by adopting restrictive assumptions. Such approaches are suitable for investigative studies which have a small scope and are of a partial nature. However, in this instance, resource limitations prevented sufficient collection and analysis for even a limited study along these lines.

The paucity of detailed information concerning transport services indicates that the size of the project required to satisfy the ideal needs of a cost recovery study would be gargantuan. Moreover, social costs and benefits must be subjectively assessed and these may be highly significant in the case of transport. Therefore, the study was limited to detailing financial results. It may be of rather more value in setting out the difficulties inherent in cost recovery analysis than in determining appropriate levels of service and cost recovery.

Finally, it is necessary to emphasise again that the assumptions adopted for this study can never be regarded as inherently 'right' or 'wrong'. They can only really be assessed in terms of their appropriateness to the objectives of the person or organisation defining them. From this viewpoint, a commercial organisation, a government instrumentality and an individual user would have quite different views of 'proper' attribution and allocation, but no one view could be regarded as being right or wrong. Also, the various views could not be expected to coincide, except in most unusual circumstances. Although the difference of opinion is often fairly marked at the government/commercial interface, it is very important to note that differing opinions also arise within individual commercial or government organisations.

The methods used to deal with attribution, allocation, capital valuation and social costs and benefits are briefly outlined in Table 3.2. That table also gives a brief summary of the ideal method which could be adopted for treating each of these factors. From this outline (and from the preceding discussion), it can be seen that there is a considerable divergence between the ideal methods and those actually adopted in carrying out this study. To some extent, these differences reflect resource limitations within the BTE and limitations on the availability of suitably conditioned data. On the other hand, they do in some cases also reflect the fact that the ideal may be quite literally impossible to achieve. In such cases, impossibility of achievement may well point to deficiencies inherent in the theoretical economic basis for the recovery of costs.

TABLE 3.2 - IDEAL AND ADOPTED APPROACHES FOR THE BTE COST RECOVERY STUDY

Characteristic under review	Ideal Approach	Adopted Approach
Attribution	Econometric analysis to determine how taxes, subsidies and so on are shared between consumers and producers.	All taxes, subsidies and so on are borne by producers, with an unknown extent of corresponding revenue increases borne by consumers.
Allocation	Econometric analysis to split joint costs and revenues between tasks.	Arbitrary assumptions based on throughput, intent at construction, known damage relationships and other appropriate cost identification rationales.
Capital Valuation	Current market value.	(a) Actual historical cost depreciated for age; (b) Historical cost in current money values depreciated for age; (c) Actual outlays or funds set aside for capital purposes.
Valuation of Social Benefits and Costs	Subjectively assessed through the political process.	Tacitly assumed to be zero by disregarding them.

CHAPTER 4 - COST RECOVERY IN AIR TRANSPORT 1974-75

AIR TRANSPORT STRUCTURE AND TASKS

In Australia, air transport can be regarded as consisting of several readily identifiable groups of operations.

The Commonwealth Government, through the Department of Transport, provides, operates and maintains landing, terminal and air navigation facilities. The Commonwealth Government also administers the Air Navigation Act, 1920-74, and is responsible for preparation of air transport legislation and for regulatory and licensing functions (such as aircrew licensing and airworthiness surveys).

Passenger and freight services on international routes, domestic trunk routes and domestic rural routes are provided by a number of bodies. Of these, QANTAS and the Australian National Airlines Commission (operating as TAA) are owned by the Commonwealth Government, but essentially operate as private companies. Private firms, including organisations providing commuter services as well as larger companies and individuals, also provide air passenger and freight services within Australia. Finally, a number of local government authorities own and operate rural aerodromes.

Further airways functions are related to operations for defence purposes by the Department of Defence. This particular role has been ignored in this study, because it not a transport function in the strict (civil aviation) sense. It should be noted that State Governments do not play a major direct role in air transport, and such activities as they do undertake have been excluded from this analysis.

A summary of the overall air transport task for 1974-75 is given by the statistics presented in Table 4.1. It is valuable to examine these figures relative to transport statistics for other

TABLE 4.1 - AIR TRANSPORT STATISTICS 1974-75

Item	Scheduled Airline Operations				General Aviation (d)	Total (d)
	International (b)	Domestic (c)				
		Trunk	Other	Total		
Hours Flown ('000) (a)	197.4	207.6	80.6	288.2	1236.7 (59.7)	1722.3 (59.7)
Passenger Movements ('000)	2434.5	7953.3	1435.9	9389.2	(277.6)	12101.3 (b)
Passenger-km (millions)	22670.0	6755.5	809.0	7564.5	(70.9)	30305.4 (e)
Passenger-tonne-km (millions)	2078.8	608.0	72.8	680.8	(6.4)	2766.0 (e)
Freight Movements ('000 tonnes) (b)	73.0	109.0	12.1	121.2	(1.9)	196.1 (e)
Freight-tonne-km (millions) (f)	587.0	101.0	12.7	113.7	(0.7)	701.4 (e)

(a) Source: Department of Transport, Statistics of the Air Transport Industry - Year Ended 30 June 1975 (Hours Flown Survey).
(b) Source: Department of Transport, Australian International Air Statistics - Year Ended 31 December 1974, and same publication for year ended 31 December 1975.
(c) Source: Department of Transport, Domestic Air Transport Statistics - Year Ended 31 December 1974, and same publication for year ended 31 December 1975.
(d) Brackets indicate figures for commuter services only.
(e) Total excluding non-commuter general aviation.
(f) Includes mail.

modes. The domestic air freight task represents only about 0.06 percent of the total freight transport task, when both are measured in tonne-kilometres(1). However, the domestic air passenger task covers nearly 36 percent of the total domestic 'commercial' passenger transport task(2). Thus, air transport provides a sizeable passenger service but plays only a relatively insignificant role in the sphere of freight movement. General aviation, while not having a major effect on either commercial passenger or freight movements, represents 76 percent of the total hours flown by aircraft in Australia. This is due in part to the slower mean speeds and much smaller capacities of aircraft flown in general aviation operations compared to those used for regular airline services. However, it is also a reflection of the large numbers of aircraft involved in general aviation.

From Table 4.1, it is evident that domestic trunk airlines perform the largest proportion of air passenger and freight movements while international air transport involves the largest task in terms of tonne-kilometres. Different modes of transport (as well as different vehicles within particular modes) display varying comparative advantages in performing specific tasks. Hence, no single mode is a perfect substitute for any other. Each has a comparative advantage over the others in certain respects. Air transport has the prime advantage of speed of movement over relatively long routes such as those between large cities. Conversely, aircraft have limited payload capabilities which reduce the current effectiveness of air transport for freight operations.

ORGANISATION OF THE STUDY OF AIR TRANSPORT

In Chapter 1, a detailed system by which transport tasks could be defined was established. In particular, Table 1.1 and Figure 1.1 presented a system which could be used to delineate cost recovery

(1) Source: BTE, Transport Information Bulletin, June Quarter, 1976, Tables 38 and 39R.
(2) Ibid, Table 41R. Includes air, road, rail and sea passenger services conducted on a hire and reward basis only, measured in terms of passenger-kilometres.

figures on a formally structured and identical basis for each mode. It was intended that the system devised would be sufficiently in the nature of a 'lowest common denominator' to permit aggregation of different modal organisation structures to a single comparable basis. It was, however, foreshadowed that certain elements in the whole structure would be missing because of their literal non-existence (e.g. international rail freight) or limited significance, or because of insurmountable data difficulties. Accordingly, Figure 4.1 shows the way in which the common structure was applied to reporting the results of the cost recovery analysis in air transport. That diagram indicates the non-existent or insignificant elements, together with those for which suitable data were unavailable.

It was also foreshadowed in Chapter 1 that it would not usually be feasible to analyse cost recovery in depth on this formal basis. This was a result of the different ways in which organisational and institutional structures for each mode are set up. In the case of air transport, it would not be productive to examine all non-urban domestic operations together, since there is a clear statistical division (and a somewhat less clear industry division) between so-called 'trunk' services and other non-urban domestic services. To ignore this division would involve a considerable loss of valuable information. Therefore, the BTE analysis of cost recovery in air transport takes due account of this fact, and covers this difference (as well as other similar ones). The real point is that an equivalent division might not exist for other modes of transport, and it would therefore be impossible to make cross-modal comparisons on a basis as fine as this. However, when the figures for 'non-standard' modal structures are aggregated to the formal structure given in Figure 1.1 (and, for air transport, in Figure 4.1), such comparisons can be made where they exist. Other problems do exist in making such comparisons, however, and these are discussed later in this report.

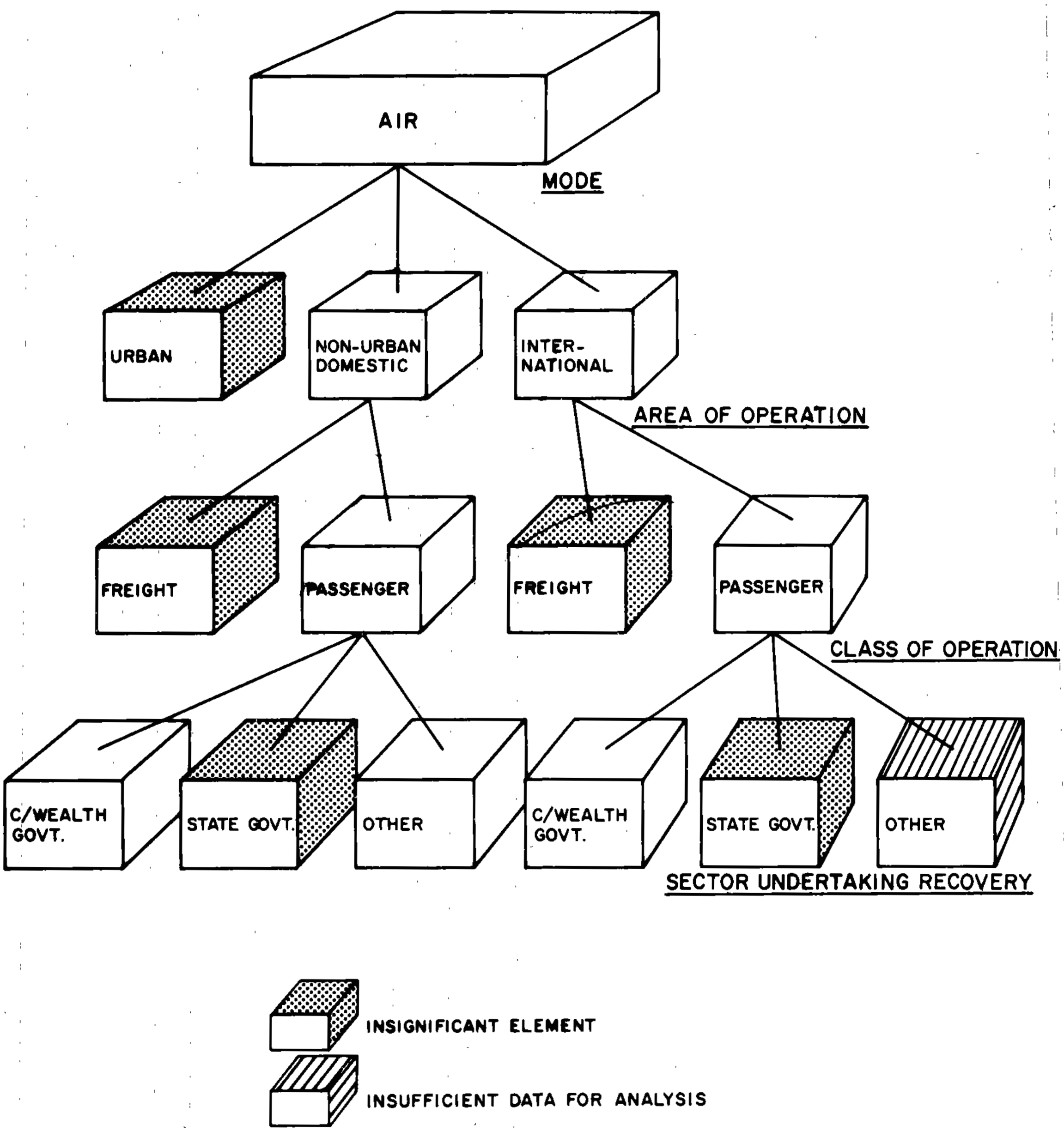


FIGURE 4·1
FORMAL STRUCTURE FOR REPORTING COST RECOVERY FIGURES IN AIR TRANSPORT

With these considerations in mind, the organisation of air transport in Australia was appraised with the object of developing a suitable practical structure for analysis of cost recovery. This task was carried out preserving the initial formal study framework (that is, mode, area of operation, class of service and sector undertaking recovery). The results are shown in Table 4.2, which reflects industry and government organisation within the field of air transport, while retaining the possibility of eventually relating the results to the formal analytical framework shown in Figure 4.1. Table 4.2 also indicates, by omission and implication, those elements of air transport which could not be examined in the study. The practical framework within which cost recovery within air transport was analysed is shown in Figure 4.2. A particular point which should be noted with regard to Figure 4.2 is that passenger and freight operations were combined for the purposes of the analysis.

There are several other points related to Table 4.2 (and Figure 4.2) which warrant further discussion. The first is the fact that local government authorities were excluded from the analysis. The role of local government in air transport (through participation in schemes involving local ownership of aerodromes) was discussed in Chapter 2. Although this involvement is recognised as a legitimate part of the air transport infrastructure in Australia, it is nevertheless very minor. Equally, it would be quite difficult to obtain extensive information on costs and revenues in this area. In view of these considerations, the BTE felt that its resources would be best employed in a more detailed investigation of larger elements of the air transport system.

The next point is that it was considered appropriate to include TAA (which is owned by the Commonwealth Government) with airlines owned by private enterprise. The main reason for this was that TAA is managed and operated on the same basis as other commercial enterprises. However, an important secondary reason was that it was regarded as desirable to draw the distinction between the Commonwealth role in providing infrastructure and its largely

TABLE 4.2 - ORGANISATIONAL STRUCTURE FOR AIR TRANSPORT

Attribute	Classification	Notes and Comments
MODE	Air	
AREA OF OPERATION	Non-urban Domestic	
	. Domestic (Trunk)	Denotes routes with competitive services[a]
	. Domestic (Rural)	Denotes routes without competitive services[a]
	. Domestic (General)	
	International	
CLASS OF OPERATION	Passenger and Freight Transport Combined	Analysed for all areas of operation[b]
SECTOR UNDERTAKING RECOVERY	Commonwealth Government	As a provider of infrastructure[c]
	Other	Including TAA[d]

(a) This is a traditional but rather ephemeral definition discussed earlier.
(b) Freight transport by air was not treated separately for several reasons (see text).
(c) Mainly through the Department of Transport.
(d) The question of rationales for including Commonwealth Government airlines with their private-enterprise counterparts is discussed in the text. In any case, the question of separate treatment for QANTAS did not arise, since it was found impossible to separate international airline revenues and costs (including those of QANTAS) relating solely to Australian operations.

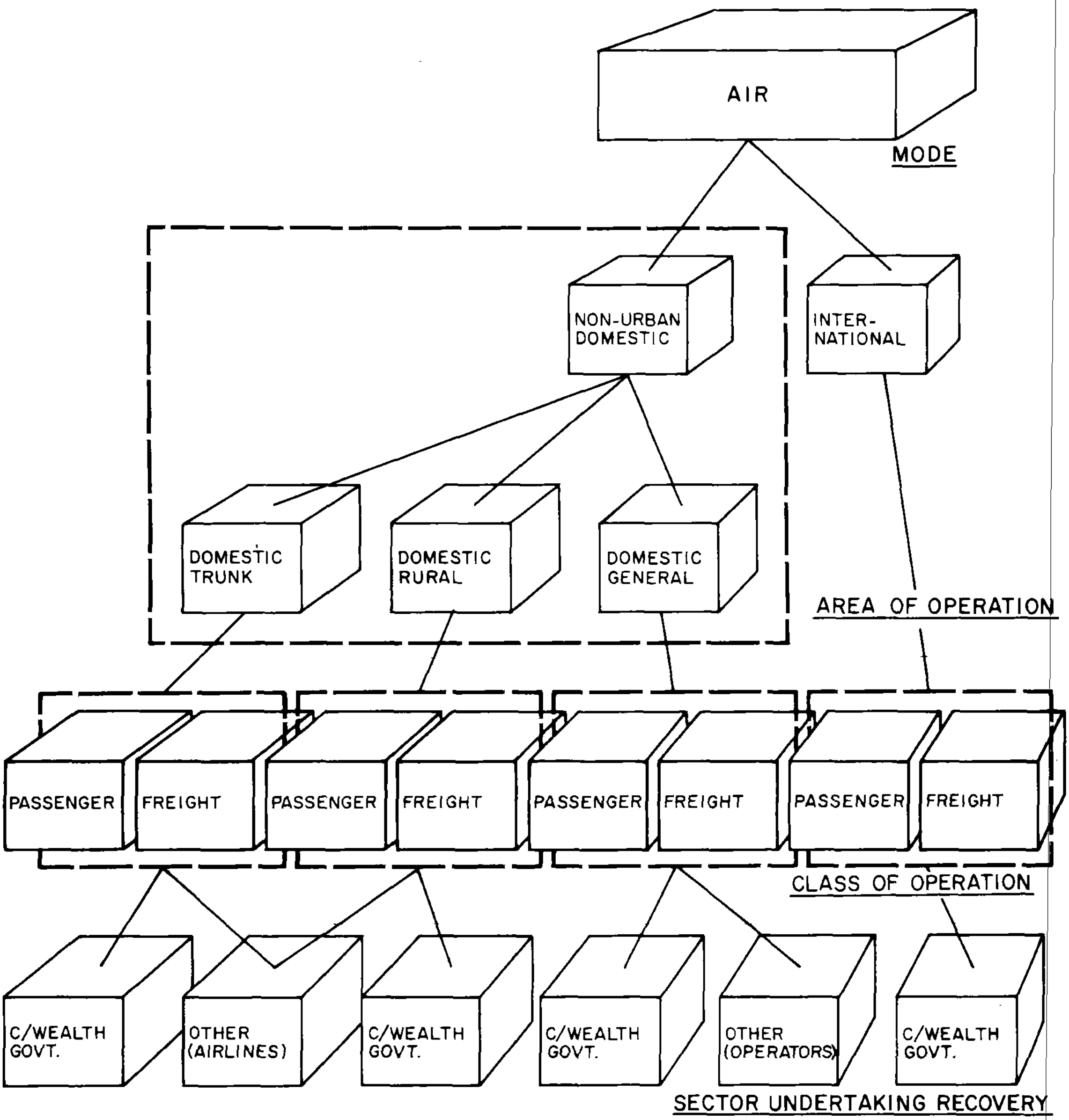


FIGURE 4·2

PRACTICAL FRAMEWORK FOR ANALYSING COST RECOVERY IN AIR TRANSPORT separate role in supporting a government-owned domestic airline. The reasons for the two roles are quite different. The same problem did not arise with the government-owned international airline QANTAS, as data limitations precluded the analysis of cost recovery in operations by international airlines (including QANTAS) altogether. The reason for this was that it was found to be impossible to segregate costs and revenues which related solely to Australian operations from the published material available on such airlines. Similarly, Commonwealth Government cost recovery from domestic trunk and rural air transport operations could be analysed separately. However, it was necessary to combine these operations when analysing industry cost recovery, since annual reports did not provide sufficiently detailed information to maintain this separate treatment.

In summary, the analysis covered cost recovery by two sectors operating within the air transport field. The first sector ('Commonwealth Government') encompasses most of the Commonwealth Department of Transport's operations within air transport. These include the provision, operation and maintenance of all air landing, terminal and navigation facilities controlled by the Department. In addition, the Department's regulatory, licensing and research functions were included as part of its operations and were therefore also covered by the study. However, the Commonwealth Government sector also includes revenue collection by other Commonwealth agencies (for example, company tax collections by the Treasury). The second sector ('Other') includes domestic and general aviation operations. Domestic operations analysed in the study basically included air transport activities by TAA and Ansett Transport Industries. However, this sector also includes the general aviation industry when applied to the appropriate areas of operation. It also includes all other general commercial aviation operations.

METHODS ADOPTED IN THE STUDY OF AIR TRANSPORT

Attribution - Revenues

The problems involved in attributing revenues and costs to specific transport operations were discussed at length in Chapter 3. For the purposes of analysing cost recovery in air transport, the following items were treated as fully-attributed revenues to the Commonwealth Government:

- Revenues from air navigation charges;
- Revenues from terminal franchises and other airport concessions;
- Excise on aviation fuel sales;
- Company taxes paid by organisations involved in air transport operations;
- Dividends from government-owned airlines.

It has already been mentioned that the activities of international airlines were excluded from the study because of difficulties encountered in determining which parts of their costs and revenues were attributable to Australian operations. However, dividends and company taxes paid by QANTAS were included as revenues collected by the Commonwealth Government, since they could be legitimately regarded as offsetting its costs incurred in supporting international air transport activities. For private-enterprise domestic airlines (including, in this context, TAA), all incomes received from fares, freight charges, subsidies and other sources related to air transport activities were treated as revenues.

Attribution - Costs

The BTE's approach in determining those Commonwealth Government costs which should be attributed to air transport differs considerably from the usual practice. As well as obviously attributable costs (such as those incurred in building and operating airports) the analysis included the following specific costs items:

- Contributions to international civil aviation bodies;
- Subsidies to operators;
- Costs incurred in research, policy and planning work associated with air transport;
- Costs associated with licensing;
- Costs associated with airworthiness and air safety investigations;
- All administrative overheads associated with air transport activities;
- All superannuation provisions for staff involved in activities related to air transport.

In fact, all Commonwealth Government costs associated with air transport activities were included, except those involved in the Department of Transport's contribution to the Australian Development Assistance Agency's works program. This latter exclusion only amounted to $0.4M in 1974-75. The rationale for including all of the costs outlined above was given in Chapter 3, but it should be emphasised that this approach is not the same as that adopted in terms of the Airlines Agreement.

All operating costs related to air transport activities for domestic airlines were fully attributed in this study. Those proportions of overheads and capital charges which could be identified as relating to air transport activities were also included.

Methods used in determining capital costs for air transport are treated in detail in Annex A.

Allocation - Revenues

Commonwealth Government revenues from air transport were relatively simple to allocate, since the Department of Transport records most sources of revenue separately within each of the four areas of operation shown in Figure 4.2. Excise on aviation fuel is not paid by international operators, and revenues from this source were allocated between the other three areas of operation on the basis of fuel consumption figures obtained from the Air Transport Policy Division of the Department of Transport. Commonwealth Government revenues from company taxes were allocated simply by referring to the sources of such payments. Revenues for the domestic airlines and other operators were allocated according to the figures contained in their published financial accounts.

Allocation - Costs

The Commonwealth Government's costs in the air transport field were allocated using the same methods as those adopted by the Air Transport Policy Division of the Department of Transport for its own cost recovery studies. On this basis, operating costs were apportioned between the four areas of operation according to a workload assessment system developed by regional offices of the Department of Transport over a period of several years. Capital costs were allocated by application of the system shown in Table 4.3. It should be emphasised that the BTE accepts that this method of allocation gives costs which are reasonably well related to the actual costs of providing specific services. Whether such costs should be used as a basis for pricing is an altogether different question, and involves complex issues of economic efficiency. Nevertheless, the system was accepted, and was in fact also applied to costs which the BTE attributed to air transport but which the Department of Transport did not.

Costs for the domestic airlines and other operators were allocated in the same way as their revenues (that is, on the basis of published financial accounts).

Data Sources

The data used in this analysis were obtained from a number of sources. The amount of detail provided by such sources varied

TABLE 4.3 - METHODS OF ALLOCATION OF CAPITAL COSTS

Capital Item	Basis of Allocation
PAVED RUNWAYS	Allocated on the basis of runway lengths and aircraft movements as follows: For runway lengths: . Over 2750m: Fully allocated to international services. . 1560m to 2750m: Allocated to international and domestic trunk services according to the relative numbers of aircraft movements. . 920m to 1560m: Allocated to international, domestic trunk and domestic rural services according to the relative numbers of aircraft movements. . Below 920m: Allocated to all four areas of operation according to the relative numbers of aircraft movements.
JOINTLY-USED TERMINALS	Allocated to users on the basis of floor space occupied (or on the basis of passengers moved where floor space was occupied jointly).
RESCUE AND FIRE	Cost differences incurred in meeting ICAO standards instead of those laid down by the Department of Transport were allocated fully to international services. The remaining costs were shared between the other operational areas.
NAVIGATION FACILITIES	Allocation was based on aircraft movements. Costs for en-route aids were shared between domestic and international services only.

markedly. In particular, use of some sources involved a degree of interpolation or extrapolation.

Analysis of the Department of Transport's operations was performed using techniques developed in consultation with officers of the Air Transport Policy Division. Information concerning fuel taxes was extracted from annual publications produced by the Petroleum Information Bureau(1). Figures relating to the tasks performed in the various areas of operation were obtained from the Department of Transport's Annual Report(2), and other related publications, and from statistics of Australian air services(3).

The annual reports published by TAA, Ansett Transport Industries and QANTAS were used in the analysis of airline operations, and information on general aviation was obtained from Niall's(4) research into the general aviation industry. Ansett Transport Industries' annual report presented one profit and loss account for both the parent company and consolidated companies. Consequently, a number of individual items (and especially those of a capital nature) were apportioned according to the relative values of assets involved in airline operations and in the total company operation.

When using the incurred capital cost method of valuing capital items, it was not always possible to distinguish the intent of all provisions shown in the available financial statements. A general problem encountered in such cases was to distinguish between replacement and upgrading of assets. With rapid changes in

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(1) Petroleum Information Bureau, Oil and Australia 1975: The Figures Behind the Facts, December 1975, Melbourne, Australia.

(2) Department of Transport, Australian Transport 1974-75, AGPS, Canberra, 1975.

(3) Department of Transport, Domestic Air Transport Statistics (various years), Statistics of Australian Commuter Air Services (various years), and International Air Transport Statistics (various years).

(4) Niall J., The General Aviation Industry in Australia. Institute of Applied Economic and Social Research, University of Melbourne, 1974.

technology, replacement inevitably also includes a significant measure of upgrading. For example, some capital provisions were noted as 'provision for depreciation and obsolescence', but no breakdown between these two categories was shown. In such cases, the provisions were ignored, since any assumptions regarding allocation could only be pure speculation. Moreover, the Department of Transport makes no provision per se for the replacement of its asset stock.

Niall[1] provides an indication of the provisions for interest and replacement made by the general aviation industry. These figures were used in determining cost recovery figures for this form of air transport.

RESULTS AND CONCLUSIONS - AIR TRANSPORT

The methods described above were used to derive estimates of revenues and costs for air transport. These estimates are presented in Tables 4.4 to 4.7. Each of these tables gives detailed revenues and costs for activities within one of the areas of operation shown in Figure 4.2. Each table shows revenues and costs for both the Commonwealth Government sector and the 'other' sector (i.e. the sector covering private enterprise air transport activities). The figures were presented in this way to simplify identification of transfer payments and so on. It should be specifically noted that these tables are not in the nature of 'balance sheets'. They give actual revenues and costs, and do not include balancing cost items such as dividends, since these are usually paid to agencies or individuals external to the frame of reference adopted for this study. However, dividends paid by TAA and QANTAS are included as revenues to the Commonwealth Government, since these dividends are transfer payments which exist entirely within the system analysed. On the other

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(1) Niall J., op.cit., p. 35.

TABLE 4.4 - AIR TRANSPORT REVENUES AND COSTS - DOMESTIC TRUNK OPERATIONS[a] - PASSENGER AND FREIGHT COMBINED - 1974-75

Sources of Revenues & Costs	Commonwealth Government			Other[a]		
REVENUES ($M)						
Air Navigation Charges		17.3			-	
Fuel Excise		27.8			-	
Commercial Rentals & Concessions		7.4			-	
Company Tax		3.1			-	
Dividends[b]		0.1			-	
Fares, Freight Charges, etc.		-			421.0	
Subsidies		-			0.9	
TOTAL REVENUES ($M)		55.7			421.9	
COSTS ($M)	HC[c]	IHC[d]	ICC[e]	HC[c]	IHC[d]	ICC[e]
Depreciation	4.1	10.7	-	28.8	52.0	-
Interest	13.7	39.6	12.1	19.4	43.4	14.4
Operating Costs	57.7	57.7	57.7	354.9	354.9	354.9
Company Tax	-	-	-	4.6	4.6	4.6
TOTAL COSTS ($M)	75.5	108.0	69.8	407.7	454.9	373.9

(a) Domestic trunk and domestic rural operations are combined for the analysis of airline operations ('other' sector), but are treated separately as they apply to Commonwealth Government activities.

(b) Dividends from TAA (see text). Note that all TAA dividends were taken as if they applied solely to domestic trunk services.

(c) Indicates the Historical Cost method of treating capital costs.

(d) Indicates the Indexed Historical Cost method of treating capital costs.

(e) Indicates the Incurred Capital Cost method of treating capital costs.

TABLE 4.5 - AIR TRANSPORT REVENUES AND COSTS - DOMESTIC RURAL OPERATIONS[a] - PASSENGER AND FREIGHT COMBINED - 1974-75

Sources of Revenues & Costs	Commonwealth Government			Other[a]
REVENUES ($M)				
Air Navigation Charges		1.2		
Fuel Excise		4.1		
Commercial Rentals & Concessions		1.0		
Company Tax		1.5		
Dividends[b]		-		
Fares, Freight Charges, etc.		-		
Subsidies		-		
TOTAL REVENUES ($M)		7.8		
COSTS ($M)	HC[c]	IHC[d]	ICC[e]	
Depreciation	1.7	4.3	-	
Interest	5.5	16.0	4.9	
Operating Costs	22.9	22.9	22.9	
Company Tax	-	-	-	
TOTAL COSTS ($M)	30.1	43.2	27.8	

(a) Domestic trunk and domestic rural operations are combined for the analysis of airline operations ('other' sector). See Table 4.4.
(b) Dividends from dmestic rural operations by TAA were included in domestic trunk figures (see Table 4.4 and text).
(c) Indicates the Historical Cost method of treating capital costs.
(d) Indicates the Indexed Historical Cost method of treating capital costs.
(e) Indicates the Incurred Capital Cost method of treating capital costs.

TABLE 4.6 - AIR TRANSPORT REVENUES AND COSTS - DOMESTIC GENERAL OPERATIONS - PASSENGER AND FREIGHT COMBINED - 1974-75

Sources of Revenues & Costs	Commonwealth Government			Other		
REVENUES ($M)						
Air Navigation Charges		2.4			-	
Fuel Excise		3.7			-	
Commercial Rentals & Concessions		1.2			-	
Company Tax		-			-	
Dividends		-			-	
Fares, Freight Charges, etc.		-			53.7	
Subsidies		-			0.1	
TOTAL REVENUES ($M)		7.3			53.8	
COSTS ($M)	HC(a)	IHC(b)	ICC(c)	HC(a)	IHC(b)	ICC(c)
Depreciation	1.0	2.6	-	5.0	8.3	2.2
Interest	3.3	9.4	2.9	4.2	7.0	1.1
Operating Costs	45.3	45.3	45.3	53.8	53.8	53.8
Company Tax	-	-	-	-	-	-
TOTAL COSTS (SM)	49.6	57.3	48.2	63.0	69.1	57.1

(a) Indicates the Historic Cost method of treating capital costs.
(b) Indicates the Indexed Historical Cost method of treating capital costs.
(c) Indicates the Incurred Capital Cost method of treating capital costs.

TABLE 4.7 - AIR TRANSPORT REVENUES AND COSTS - INTERNATIONAL OPERATIONS[(a)] - PASSENGER AND FREIGHT COMBINED - 1974-75

Sources of Revenues & Costs	Commonwealth Government			Other[(a)]		
REVENUES ($M)						
Air Navigation Charges		24.0				
Fuel Excise		-				
Commercial Rentals & Concessions		5.5				
Company Tax		0.1				
Dividends[(b)]		3.2				
TOTAL REVENUES ($M)		32.8				
COSTS ($M)	HC[(c)]	IHC[(d)]	ICC[(e)]	HC[(c)]	IHC[(d)]	ICC[(e)]
Depreciation	2.6	6.8	-			
Interest	8.5	24.9	7.6			
Operating Costs	26.2	26.2	26.2			
TOTAL COSTS ($M)	37.3	57.9	33.8			

(a) Analysis of international airlines' operations ('other' sector) was not performed because of data identification problems. (see text).
(b) Dividends from QANTAS (see text).
(c) Indicates the Historical Cost method of treating capital costs.
(d) Indicates the Indexed Historical Cost method of treating capital costs.
(e) Indicates the Incurred Capital Cost method of treating capital costs.

hand, interest and capital repayments by TAA and QANTAS are included as costs to these organisations. However, they do not involve corresponding revenues to the Commonwealth Government, despite the fact that the loans to which such payments relate were made under the aegis of the Commonwealth. The usual situation is that the Commonwealth Government arranges loans from overseas on behalf of TAA and QANTAS. Therefore, repayments are effectively made to external agencies. It is undeniable that this is an advantageous situation for these airlines, but it is impossible to quantify the actual level of transfer between them and the Commonwealth Government. It might also be commented that an absolutely complete enumeration of all revenues and costs would lead to invariable cost recovery ratios of 100 per cent.

It will be noted that cost items have three different sets of values in Tables 4.4 to 4.7. The three different sets of costs relate to the alternative methods of treating capital costs. These methods are explored in detail in Annex A. Some of the depreciation and interest figures presented in Tables 4.4 to 4.7 are also actually derived in Annex A. The other cost elements (operating costs and company tax) do not, of course, vary with the method chosen to value capital assets. It will also be noted that domestic trunk and domestic rural operations are treated separately as they apply to operations by the Commonwealth Government, but that they are combined when examined in the context of the 'other' sector. The reasons for this have been explained previously. Similarly, international air transport activities have only been included in the context of activities by the Commonwealth Government in this field. Again, the data deficiencies which forced this simplification have been described previously.

The next stage in the analysis was to apply the estimates of revenues and costs in Tables 4.4 to 4.7 to the 'practical' framework developed earlier and shown in Figure 4.2. Table 4.8 shows recovery by the Commonwealth Government in terms of that frame-

TABLE 4.8 - AIR TRANSPORT COST RECOVERY SUMMARY - PRACTICAL FRAMEWORK[(a)] - COMMONWEALTH GOVERNMENT - 1974-75

Area of Operation	Class of Operation	Item	Values HC[(b)]	IHC[(c)]	ICC[(d)]
DOMESTIC TRUNK OPERATIONS	Passenger and Freight Combined	Revenues ($M)	55.7	55.7	55.7
		Costs ($M)	75.5	108.0	69.8
		Balance ($M)	-19.8	-52.3	-14.1
		Cost Recovery	74%	52%	80%
DOMESTIC RURAL OPERATIONS	Passenger and Freight Combined	Revenues ($M)	7.8	7.8	7.8
		Costs ($M)	30.1	43.2	27.8
		Balance ($M)	-22.3	-35.4	-20.0
		Cost Recovery	26%	18%	28%
DOMESTIC GENERAL OPERATIONS	Passenger and Freight Combined	Revenues ($M)	7.3	7.3	7.3
		Costs ($M)	49.6	57.3	48.2
		Balance ($M)	-42.3	-50.0	-40.9
		Cost Recovery	15%	13%	15%
ALL DOMESTIC OPERATIONS	Passenger and Freight Combined	Revenues ($M)	70.8	70.8	70.8
		Costs ($M)	155.2	208.5	145.8
		Balance ($M)	-84.4	-137.7	-75.0
		Cost Recovery	46%	34%	49%
INTERNATIONAL OPERATIONS	Passenger and Freight Combined	Revenues ($M)	32.8	32.8	32.8
		Costs ($M)	37.3	57.9	33.8
		Balance ($M)	-4.5	-25.1	-1.0
		Cost Recovery	88%	57%	97%
ALL OPERATIONS	Passenger and Freight Combined	Revenues ($M)	103.6	103.6	103.6
		Costs ($M)	192.5	266.4	179.6
		Balance ($M)	-88.9	-162.8	-76.0
		Cost Recovery	54%	39%	58%

(a) Indicates the instituational and organisational system of reporting shown in Figure 4.2.
(b) Indicates the Historical Cost method of treating capital costs.
(c) Indicates the Indexed Historical Cost method of treating capital costs.
(d) Indicates the Incurred Capital Cost method of treating capital costs.

TABLE 4.9 - AIR TRANSPORT COST RECOVERY SUMMARY - PRACTICAL FRAMEWORK[(a)] - OTHER - 1974-75

Area of Operation	Class of Operation	Item	Values HC[(b)]	IHC[(c)]	ICC[(d)]
DOMESTIC TRUNK AND RURAL OPERATIONS COMBINED	Passenger and Freight Combined	Revenues ($M)	421.9	421.9	421.9
		Costs ($M)	407.7	454.9	373.9
		Balance ($M)	+14.2	-33.0	+48.0
		Cost Recovery	103%	93%	113%
DOMESTIC GENERAL OPERATIONS	Passenger and Freight Combined	Revenues ($M)	53.8	53.8	53.8
		Costs ($M)	63.0	69.1	57.1
		Balance ($M)	-9.2	-15.3	-3.3
		Cost Recovery	85%	78%	94%
ALL DOMESTIC OPERATIONS	Passenger and Freight Combined	Revenues ($M)	475.7	475.7	475.7
		Costs ($M)	470.7	524.0	431.0
		Balance ($M)	+5.0	-48.3	+44.7
		Cost Recovery	101%	91%	110%

(a) Indicates the instituational and organisational system of reporting shown in Figure 4.2.
(b) Indicates the Historical Cost method of treating capital costs.
(c) Indicates the Indexed Historical Cost method of treating capital costs.
(d) Indicates the Incurred Capital Cost method of treating capital costs.

work. Again, three sets of cost recovery figures have been presented to reflect the three methods of treating capital costs. Corresponding figures for recovery by the 'other' sector are shown in Table 4.9. The gaps and aggregations described above for Tables 4.4 to 4.7 are also evident in Tables 4.8 and 4.9, for the same reasons.

Table 4.10 shows overall cost recovery figures for air transport in Australia. These figures were derived essentially by aggregating the values shown in Tables 4.8 and 4.9, but with some special considerations. The corresponding figures in Tables 4.8 and 4.9 cannot simply be added to give results for air transport as a whole. The reasons for this is that airlines (for example) pay navigation charges and other fees and taxes to the Commonwealth Government. Such charges appear as costs to the 'other' sector, but they are also included in the revenues to the Commonwealth Government. Simple addition of revenues and costs for the two sectors would therefore introduce a distortion through these 'transfer payments'. Overall revenues and costs therefore had to be determined on a case-by-case basis. In general, the following rationale was used to determine overall values for Table 4.10:

- Overall revenues were determined by adding 'other' revenues to Commonwealth Government revenues and subtracting the sum of transfer payments between the two sector;
- Overall costs were obtained by adding 'other' costs to Commonwealth Government costs and subtracting the sum of transfer payments between the two sectors.

Net transfer payments were determined on a case-by-case basis. Again, three sets of figures are presented in each case to show the effects of different methods of capital valuation. Also, Table 4.10 is curtailed in line with the limitations imposed on Tables 4.8 and 4.9. The figures given in Table 4.10 could be regarded as an approach to an assessment of 'total' cost recovery within the tabulated areas of air transport operation. In a sense, the figures show the amounts which users of air services and facilities pay, compared to the costs of providing such

TABLE 4.10 - AIR TRANSPORT COST RECOVERY SUMMARY - PRACTICAL FRAMEWORK[a] - OVERALL - 1974-75

Area of Operation	Class of Operation	Item	Values HC[b]	IHC[c]	ICC[d]
DOMESTIC TRUNK AND RURAL OPERATIONS COMBINED	Passenger and Freight Combined	Revenues ($M)	429.4	429.4	429.4
		Costs ($M)	457.3	550.1	415.5
		Balance ($M)	-27.9	-120.7	+13.9
		Cost Recovery	94%	78%	103%
DOMESTIC GENERAL OPERATIONS	Passenger and Freight Combined	Revenues ($M)	54.9	54.9	54.9
		Costs ($M)	106.4	120.2	99.1
		Balance ($M)	-51.5	-65.3	-44.2
		Cost Recovery	52%	46%	55%
ALL DOMESTIC OPERATIONS	Passenger and Freight Combined	Revenues ($M)	484.3	484.3	484.3
		Costs ($M)	563.7	670.3	514.6
		Balance ($M)	-79.4	-186.0	-30.3
		Cost Recovery	86%	72%	94%

(a) Indicates the instituational and organisational system of reporting shown in Figure 4.2.
(b) Indicates the Historical Cost method of treating capital costs.
(c) Indicates the Indexed Historical Cost method of treating capital costs.
(d) Indicates the Incurred Capital Cost method of treating capital costs.

services or facilities. However, this argument should not be taken too far, since there are substantial financial transfers into and out of the sectors analysed in this study. However, the figures in Table 4.10 could be regarded as an approach to the guide to whether each users of particular types of air services are 'paying their way'.

The results clearly show the effects of different treatments of capital costs. Transport in general is fairly highly capitalised, and this is even more the case when air transport is considered. It can therefore be expected that assumptions which affect capital charges will have significant impacts on the results of cost recovery studies. In all cases, the indexed historical cost (IHC) method of capital valuation gave lower cost recovery ratios than the historical cost (HC) or incurred capital cost (ICC) methods. In fact, the highest cost recovery ratios were always obtained by using the ICC method. In the BTE's opinion, the IHC method (which coincidentally gives the lowest results) is the most appropriate of the three methods in terms of resource employment. In particular, the IHC method gives the best indication of resource use and potential capital demands of a transport system, especially if the system is a highly capital-intensive one. On the other hand, the ICC method gives a more appropriate indication of the financial viability of a system.

Partly as a result of the treatment of capital costs, the figures presented in this report give lower estimates of cost recovery in air transport than commonly-accepted alternative estimates. However, another significant factor which brings about this situation is that the BTE included many costs on the Commonwealth Government side which are not usually included in such analyses. The rationale for including (or, rather, not excluding) such costs was given in Chapter 3. However, it is worthwhile to repeat that the BTE recognises no arbitrary reasons why costs such as those involved in activities such as licensing and other regulatory functions should be ignored. This is particularly the case when these costs are regarded as 'legitimate' in the case of other transport modes.

The figures given in Tables 4.8, 4.9 and 4.10 are drawn into the formal structure of the study in Chapter 8 of this Report.

CHAPTER 5 - COST RECOVERY IN SEA TRANSPORT 1974-75

SEA TRANSPORT STRUCTURE AND TASKS

As in the case of air transport, several identifiable groups of operation can be regarded as comprising sea transport in Australia.

The Commonwealth Government, through the Department of Transport, provides, operates and maintains lighthouses, other marine navigation aids, oil dispersal facilities and a very limited amount of seaport infrastructure. The Commonwealth Government also administers the Navigation Act 1912-1973, and is responsible for preparation of sea transport legislation and for regulatory and licensing functions (such as licensing of seamen and seaworthiness surveys). The Marine Operations Centre (which functions as a central reporting point and as a search and rescue co-ordination agency) is also operated by the Commonwealth. In addition, the Ship Construction Bounty Act 1975 was administered by the Department of Transport in 1974-75[(1)]. However, this Act deals with assistance to the shipbuilding industry per se, rather than to the transport industry. For this reason, its implications have not been included in the analysis of cost recovery in sea transport.

State Governments also have a significant role in sea transport. In the main, State Governments have both Departments and statutory authorities (or other similar instrumentalities) which operate in the field of sea transport. The primary responsibilities of such organisations include planning, development and operation of port facilities, channels, navigation aids and associated infrastructure. The extent of such operations varies significantly from State to

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(1) Administration of this Act has since passed to the Department of Industry and Commerce.

State. Also, the nature of the agencies involved (boards, trusts, Departments etc) varies from place to place, and there is a corresponding variation in the relationship of such agencies to their respective State Governments. The Western Australian State Government also operates the Western Australian Coastal Shipping Commission[1]. While this organisation is owned by the Western Australian Government, it essentially operates as a private company. The BTE considers that the operations of StateShips are both notionally and practically different from those of the ports and harbours agencies in the States.

Passenger and freight services on international routes and Australian coastal routes are provided by a number of bodies. Of these, the Australian Shipping Commission (operating as ANL) is owned by the Commonwealth Government, but essentially operates as a private company. The similar nature of StateShips has already been described. In the context of sea transport, it should be noted that passenger transport is a relatively insignificant part of sea transport operations. In some cases, special ships are provided for passenger transport (especially for international cruise purposes), while passengers and freight are carried jointly in other cases. In these circumstances, it is difficult to make a clear statement of the responsibilities for particular classes of operation. In terms of Australian operations, various private companies (and ANL and StateShips) provide services at all levels. Australia is also served by a wide range of overseas companies, including those operating cruise services. There is also a maritime 'general' area of operation (which is in some ways analogous to general aviation). General sea transport operations include fishing, ferry services and other industries which require the services of small craft.

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(1) Trading as StateShips.

There is also a significant component of sea transport operations which is related to defence activities. This particular role has been ignored in this study, because it is not directly related to transport in the usual sense. It is worth noting, however, that defence maritime operations often involve shared facilities, and also frequently impose definite constraints on merchant shipping operations (with consequent general increases in costs).

As mentioned above, each level of service in sea transport involves movements of both passengers and freight. Table 5.1 shows the size of the tasks performed in the international and coastal parts of Australian sea transportation 1974-75. Operations at the general level are not included in Table 5.1, because consistent and convincing information on the multiplicity of small tasks involved was simply not available.

The dominant part of the sea transport task is carriage of freight. The sea transport passenger task is insignificant on the basis of the proportion of passenger trade relative to the total sea transport task. However, it is also insignificant on the basis of the proportion of sea passengers relative to the total passenger transport task across all modes. While sea transport carried in excess of 160 million net tonnes of cargo in 1974-75, less than 590,000 passengers were transported(1). Only 3 per cent of international journeys were made by sea(2) and less than 1 per cent of domestic 'commercial' trips were made by that mode(3). On the other hand, about 49 per cent of the total Australian domestic freight transport task (measured in tonne-km) was per-

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(1) ABS, Passenger Movement by Sea at Australian Ports 1974, Table 1; 1975 figures are not yet available.
(2) ABS, Overseas Arrivals and Departures 1975, Table 5. Excludes 'cruise' passengers.
(3) Based on BTE, Transport Information Bulletin, op.cit, p. 69, and unpublished data.

TABLE 5.1 - SEA TRANSPORT STATISTICS 1974-75

Item	International	Coastal	Total
Vessel Berthings[a]	12175	8442	20617
Passenger Movements[b] ('000)	296	290	586
Passenger-km (million)	n.a.	207[c]	n.a.
Passenger-tonne-km (million)	n.a.	n.a.	n.a.
Freight Movements[d] (million net tonnes)	187	56	243
Freight-tonne-km (thousand million)	n.a.	97[e]	n.a.

(a) ABS, Overseas and Coastal Shipping 1974-75, p. 15.
(b) Passengers embarking and passengers disembarking at Australian ports were summed to give passenger movements. Source: ABS, Passenger Movements by Sea at Australian Ports, 1974. Reference No. 4.22, Table 1.
(c) This is a preliminary 1973-74 estimate from BTE, Transport Information Bulletin, September Quarter 1976, Table 4.1. This is the most recent information available.
(d) ABS, Overseas and Coastal Shipping 1974-75, p. 14. Includes cargo discharged and loaded.
(e) BTE, Estimates of the Australian Freight Traffic Task, 1960-61 to 1974-75, Information Paper 1976.

formed by sea. Therefore sea freight could be regarded as important on this basis. It should be noted, however, that sea transport only accounted for 4 per cent of domestic freight movements measured in tonnes. This is a reflection of the fact that the domestic sea transport is predominantly long-distance movement of domestic freight.

From the figures presented in Table 5.1, it is clear that sea transport is rather anomalous with regard to its position in the Australian transport picture. This is a direct result of the fact that sea transport in general has been undergoing significant changes over a lengthy period. For example, choice of 1974-75 as the year for which this analysis would be performed meant that the last vestiges of international sea passenger liner trades were included. This type of trade has since disappeared almost completely, and the sea transport role in international passenger travel contracted virtually entirely to the popular (but relatively insignificant) cruise activities. At the other end of the scale, domestic (or coastal) sea-freight activities are becoming more and more specialised. Sea transport is being used in such circumstances only where there is no other suitable method of transport, or in circumstances in which loading and discharge costs are low or where relatively high loading and discharge cost for sea cargo do not involve significant market disadvantages. This form of specialised segmentation of sea transport can be expected to continue.

ORGANISATION OF THE STUDY OF SEA TRANSPORT

As in the case of air transport, it is theoretically possible to describe sea transport cost recovery in terms of the framework shown in Table 1.1 and Figure 1.1. Again, there are parts of the formal structure of this study which do not apply to sea transport because of its limited areas and classes of operations. Similarly, other restrictions are placed on application of this formal structure to the study of sea transport by limited data in certain areas. In line with these restrictions, Figure 5.1 shows the way

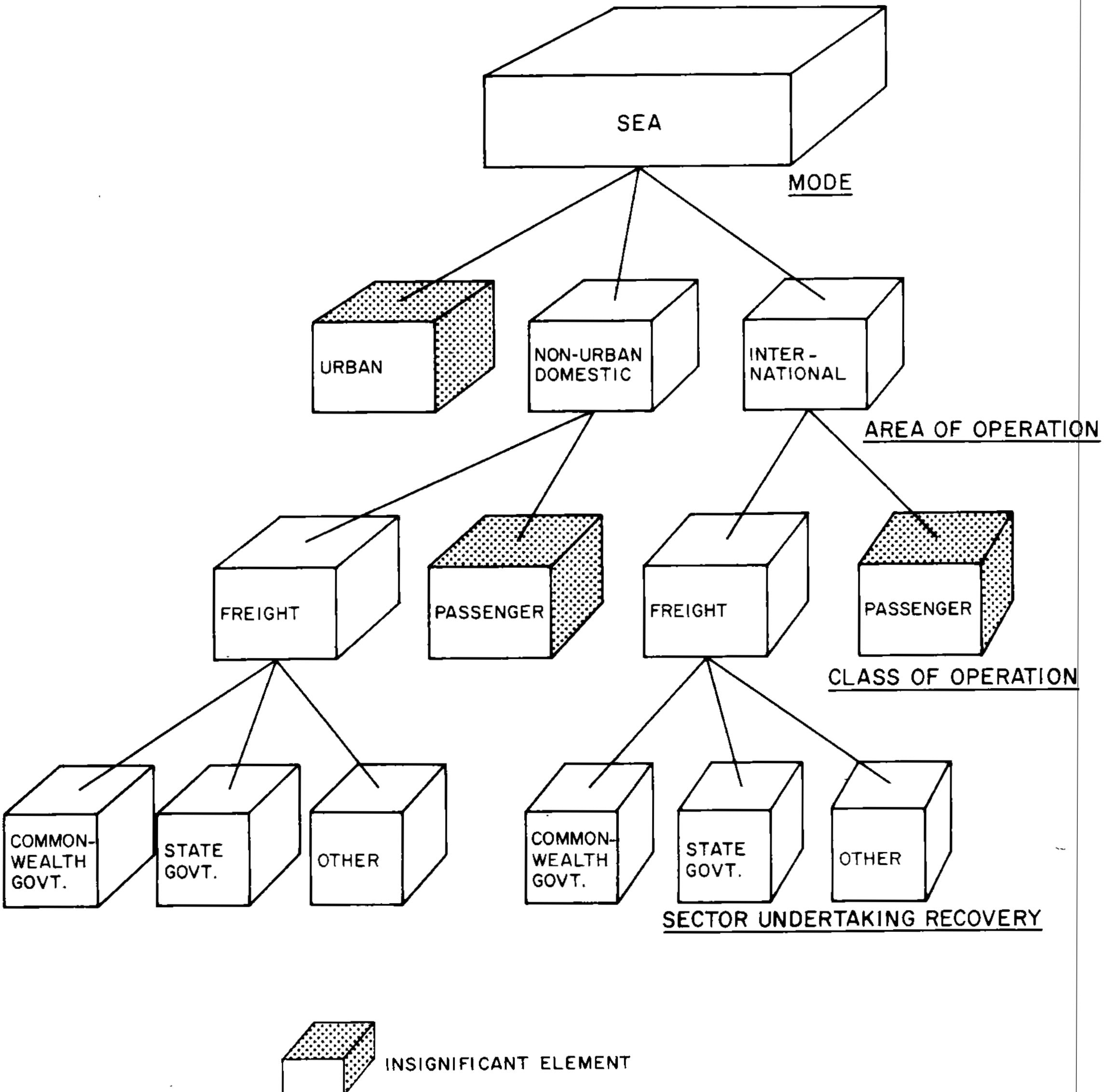

FIGURE 5·1
FORMAL STRUCTURE FOR REPORTING COST RECOVERY FIGURES IN SEA TRANSPORT

in which the common structure was applied to reporting the results of the cost recovery analysis in sea transport. That diagram indicates the non-existent or insignificant elements, together with those for which suitable data were unavailable.

It was not possible to perform a direct in-depth analysis of sea transport on this basis. Several organisational and institutional factors related to sea transport tended to work against such a possibility. Perhaps the most important of these was the fact that coastal shipping is fully accepted as a major transport enterprise. On the other hand, the very diverse fishing and leisure marine transport activities (which could fit into the non-urban - or even urban, in some cases - domestic transport area) are not really set up on the same institutional basis. In fact, there is a fairly strong argument against treating such activities as transport at all. They could equally well fall into other industry divisions (such as tourism, recreation and primary industry). While it is certainly not productive to pursue such arguments in depth, it was clearly not possible to treat these common but different maritime activities on the same basis as 'mainline' sea transport operations like coastal shipping. In any event, the difficult definitional position of fishing, leisure and other such ancillary marine operations is reinforced by an almost complete lack of information on such operations. This in itself would have precluded any meaningful analysis. Another problem which compounded this difficulty in adhering to the formal structure was the unusual nature of agencies such as ports and harbours authorities. The lack of clear links between such agencies and their parent governments (or other controlling institutions) would, in itself, inhibit application of such a clearly-defined structure.

In view of these considerations, a critical appraisal of the organisation of sea transport in Australia was performed with the object of developing a suitable practical structure for analysis

TABLE 5.2 - ORGANISATIONAL STRUCTURE FOR SEA TRANSPORT

Attribute	Classification	Notes and Comments
MODE	Sea	
AREA OF OPERATION	Non-urban Domestic	
	. Domestic (Coastal)	Excludes international lines working the Australian Coast[a]
	. Domestic (General)	Not analysed[b]
	International	
CLASS OF OPERATION	Passenger and Freight Transport Combined	Analysed for all valid areas of operation(c)
SECTOR UNDERTAKING RECOVERY	Commonwealth Government	As a provider of infrastructure[d]
	State Government	
	Other	Including ANL[e]
	Ports and Harbours Authorities	

(a) International lines (except ANL) working the Australian coast were excluded because it was impossible to separate their Australian operations from their operations in other areas.

(b) This category was included for the sake of completeness, but was not analysed because of the very diverse nature of the tasks involved.

(c) Passenger transport by sea was not treated separately for several reasons (see text).

(d) Mainly through the Department of Transport.

(e) The question of rationales for including ANL with its private-enterprise counterparts is discussed in the text. This question only arose for coastal operations, since it was found impossible to separate international shipping revenues and costs (including those of ANL) relating solely to Australian operations.

of cost recovery. This appraisal was carried out with due regard to the initial formal study framework (that is, mode, area of operation, class of operation and sector undertaking recovery). The results are shown in Table 5.2. That table reflects industry and government organisation within the field of sea transport. However, in line with the practice adopted elsewhere in this Report, it also preserves the possibility of eventually relating the results to the formal analytical framework shown in Figure 5.1. Table 5.2 also indicates, by omission or implication, those elements of sea transport which could not be examined in the study. The practical framework within which sea transport was analysed is shown in Figure 5.2. There are two particular points which should be noted with regard to Figure 5.2. The first is that passenger and freight operations were combined for the purpose of the analysis, while the second is that the 'general' (fishing, leisure, etc) operations are shown on the diagram. While these operations are shown for the sake of completeness, they were not analysed because of overwhelming data deficiencies (as well as for the other reasons noted earlier).

It was considered appropriate to include the Commonwealth Government shipping line, ANL, with private enterprise. The reasons for doing this were the same as those described in Chapter 4 regarding the Commonwealth Government's airlines TAA and QANTAS. Essentially, ANL is intended to operate on a basis comparable to that on which private enterprise shipping lines operate. Also, it is useful to separate the role of the Commonwealth Government in supporting a national shipping line from its other major roles in sea transport. A similar situation prevailed in regard to the activities of the Western Australian Coastal Shipping Commission. Because of the essentially commercial nature of this Commission's activities, they were treated as private enterprise rather than State Government operations. In both cases (that is, ANL and StateShips), profits or losses were, however, included as revenues or costs to the relevant Governments.

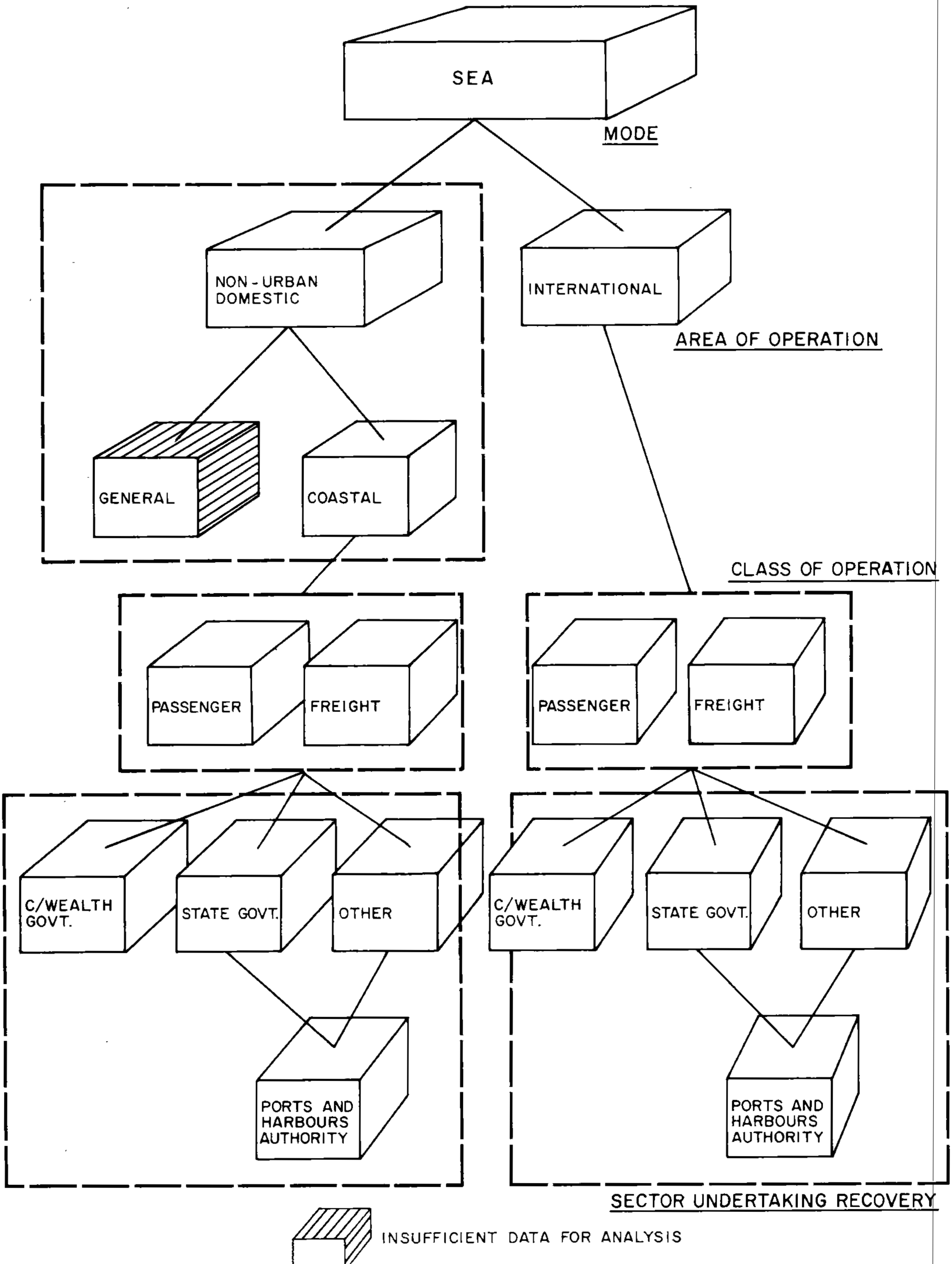

FIGURE 5·2
PRACTICAL FRAMEWORK FOR ANALYSING COST RECOVERY IN SEA TRANSPORT

A rather more difficult definitional problem was encountered in analysing the activities of ports and harbours authorities. Some of these authorities function essentially as State Government Departments or their agents. However, others have widely varying degrees of autonomy, ranging from statutory authority status to virtually fully independent operation. Even if this de facto variation in the nature of the affinities of such authorities is ignored, it is still very difficult to define the relationship of particular authorities to their parent organisations. Although many of these authorities were originally set up by State Governments or other organisations, the historic ties have weakened considerably, often to the point where they could no longer be regarded as relevant. The way in which the BTE overcame this problem in the first instance was to treat such authorities as a separate sector, because of their anomalous situation. This treatment is reflected in Figure 5.2.

As in the case of air transport, data limitations precluded the analysis of cost recovery in operations by international shipping lines (including ANL, except for its coastal operations). The reason for this was that it was found to be impossible to segregate costs and revenues which related solely to Australian operations from the published material available on such lines. However, such infrastructural activities as licensing, provision of navigational aids and ports and harbours operations related to international shipping were analysed.

In summary, the analysis covers cost recovery by four sectors operating within the sea transport field. The first sector ('Commonwealth Government') encompasses most of the Commonwealth Department of Transport's operations within sea transport. These include the provision, operation and maintenance of all maritime navigation facilities controlled by the Department. In addition, the Department's regulatory, licensing and search and rescue functions were included as part of its operations and are therefore also covered by the study. However, the Commonwealth Government sector also includes revenue collection by other Commonwealth agencies (for example, company tax collections by the Treasury). The second sector ('State Government') is limited to those activities which involve transfer of funds between State Governments and bodies engaged in sea transport operations of all types.

The third sector ('Other') covers coastal shipping operations. Coastal operations analysed in the study basically include domestic sea transport activites by ANL, StateShips and private shipping lines. The fourth and final sector ('Ports and Harbours') covers the activities of the ports and harbours authorities.

METHODS ADOPTED FOR THE STUDY OF SEA TRANSPORT

Attribution - Revenues

The problems involved in attributing revenues and costs to specific sea transport operations are in some ways similar to those discussed for air transport in Chapter 4. For the purposes of analysing cost recovery in sea transport, the following items are treated as fully-attributed revenues to the Commonwealth Government:

- Revenues from light dues (equivalent to navigation charges);
- Revenues from the Point Wilson (Vic) dangerous cargo facility;
- Revenues from the oil pollution levy;
- Revenues from mercantile marine fees (such as licence and inspection charges);
- Company taxes paid by organisations involved in sea transport operations;
- Dividends from the government-owned shipping line (ANL).

It has already been mentioned that the activities of international shipping lines were excluded from the study because of difficulties encountered in determining which parts of their costs and revenues were attributable to Australian operations. However, potential dividends and company taxes paid by ANL would be included as revenues collected by the Commonwealth Government, since they could be legitimately regarded as offsetting its costs incurred in supporting international sea transport activities. In fact, ANL did not make a profit in the year under consideration, and hence it was not necessary to take this measure.

Since the ports and harbours authorities were treated separately in this study, for the reasons outlined earlier, the revenues attributed to State Government sea transport activities were rather curtailed and artificial in nature. Essentially, the following items were fully attributed as revenues to the State Governments:

- Interest on loans made to ports and harbours authorities and other sea transport operations;
- Payroll tax collected from all forms of commercial and other sea transport organisations;
- Dividends from ports and harbours authorities;
- Dividends from StateShips (in the case of the Western Australian State Government).

For private-enterprise domestic shipping lines (including, in this context, ANL and StateShips), all incomes received from fares, freight charges, subsidies and other sources related to sea transport activities are treated as revenues.

Ports and harbours authorities (treated as a separate entity in this study) collect revenues from a very wide range of sources. There is little consistency of treatment between individual authorities, and both the extent and specific breakdown of charges may vary considerably. However, all sources of revenues related to sea transport activities[1] are fully attributed in this study. Typically, such sources include the following:

- Revenues from wharfage charges;
- Revenues from charges for entry to or exit from harbours ('tonnage' rates);
- Revenues from rental of wharf and other space;
- Revenues from towage and pilotage charges.

Attribution - Costs

When the question of attributing Commonwealth Government costs in the sea transport field was considered, the BTE had to rely heavily on the Department of Transport's own assessments. In contrast to air transport where there is a detailed formal (but artificial) mechanism for attributing cost, sea transport costs are attributed on a broad basis. In essence, the Commonwealth Government's costs are usually regarded as those involved in the Department of Transport's operational activities in sea transport (for example, performance of regulatory and licensing functions, operation and maintenance of navigation aids etc). Suitable levels of overhead charges are also included. However, in addition to these clearly attributable costs, the BTE included the following specific cost items in its analysis:

- Contributions to international shipping bodies;
- Subsidies to operators;
- Costs incurred in research, policy and planning work associated with sea transport;
- Costs associated with search and rescue operations (essentially the Marine Operations Centre);
- All administrative overheads associated with sea transport activities;

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(1) The authorities' interests in real estate around ports (but not exclusively related to sea transport) were excluded where they could be identified.

- All superannuation provisions for staff involved in activities related to sea transport.

The net result of this process was that all Commonwealth Government costs associated with sea transport activities are included, with no exceptions other than the general exclusion of Defence operations. This approach follows the theoretical rationale presented in Chapter 3, but it should be emphasised that if is not in line with common practice.

In the case of State Governments (excluding, in this context, ports and harbours authorities), all expenditure on sea transport activities are treated as fully-attributed costs. The items included varied from State to State, but typically include administrative costs and overheads, deficit funding for State-controlled sea transport operations and specific subsidies to sea transport activities or services. Capital transfers (such as loans to operating agencies) are also treated as costs, and are analysed in line with the methods detailed in Annex A.

For private-enterprise shipping lines (including ANL and StateShips), all operating costs relating to sea transport activities are fully attributed in this study. Those proportions of overheads and capital charges which could be identified as relating to sea transport activities are also included. The same approach is adopted for ports and harbours authorities.

Methods used in determining capital costs for sea transport are treated in detail in Annex A.

Allocation - Revenues

Allocation of revenues for the Commonwealth Government's sea transport activities was carried out in a detailed fashion on the basis of information collected by the Finance and Commercial

Division of the Department of Transport. Specific data were available on the payment of light dues by sea carriers in the international, interstate and intrastate trades for each quarter of 1974-75. The proportions in which such payments were made were used as a basis for allocating revenues from the oil pollution levy and Point Wilson charges. While this method of allocating revenues from these latter sources to the respective areas of operation was clearly imprecise, lack of detailed information led to their adoption by default. In 1970-71, the Finance and Commercial Division of the Department of Transport performed a detailed survey of the sources of revenues from maritime fees (such as licensing, inspection and survey charges). As fee relativities have not altered to any great extent since that time, the proportions measured for coastal and international sea transport in that survey are used as the basis of allocations for revenues from such fees 1974-75.

In the case of State Governments (again excluding ports and haraours authorities) revenues are allocated between areas of operation on the same basis as that used for the source of such revenues. In effect, this means that revenues from dividends paid by ports and harbours authorities to State Governments are allocated on the basis used to allocate the revenue when examining the authorities themselves. Dividends from StateShips (if such a dividend had been paid) would have been fully allocated to coastal sea transport.

Revenues to private-enterprise shipping lines are allocated on the basis of information contained in published financial accounts. Revenues from coastal operations of ANL are taken directly from its annual report, since the accounts presented in that report were split into revenues from overseas liner services, coastal operations and charter operations. Since all subsidies granted to ANL were intended to assist operations between Tasmania and the mainland, these subsidies are fully allocated to coastal services.

ANL's international operations are not included in the analysis for reasons described earlier. Since the other shipping lines (including StateShips) analysed were confined to coastal operations, their revenues are fully allocated to the coastal area of operation.

Allocation of revenues between international and coastal areas of operation for the ports and harbours authorities is based on material supplied by the Australian Stevedoring Industry Authority (ASIA). Using information supplied by the BTE concerning vessel characteristics[(1)] and 1974-75 charges levied at each port[(2)], coupled with their own information on vessel movements in Australian ports, ASIA has estimated coastal and international revenues to ports and harbours[(3)] which have licensed stevedores. These calculations indicate that coastal operations attracted 28 per cent of all revenues, with international operations accounting for the remaining 72 per cent. These percentages were partially confirmed by published allocations of revenues for those ports under the control of the Maritime Services Board of New South Wales. These New South Wales ports were found to have precisely the same percentage revenue earnings from coastal and international services as those estimated by ASIA for all ports using registered stevedores. Precise allocations (on the basis of published accounts) were performed for the few ports for which sufficiently detailed descriptions of revenues were available. It is assumed for the purposes of the analysis that other ports would follow the same pattern of coastal and international revenues.

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(1) From Lloyds Register of Shipping 1974-75.

(2) Taken from Richard Daykin (ed), Ports of the World 1975, Benn Brothers Limited, London, 1975; supplemented by Captain F.S. Campbell (ed), Port Dues, Charges and Accommodation 1974-75, George Philip and Son Limited, London, 1974.

(3) The BTE wishes to acknowledge the valuable assistance provided by ASIA in rendering this service.

Allocation - Costs

For the Commonwealth Government, capital costs consist of expenditures associated with the functions of the Department of Transport. Since the capital costs incurred by the Department of Transport are primarily related to lights and facilities for which use could be regarded as depending on the number of entries to port, allocation was carried out on the basis of berthings. Operating costs for navigation aids are likewise allocated on this basis. Because all revenues from the oil pollution levy and Point Wilson charges had been allocated to particular services on the basis of light dues paid by ships in such services, the costs related to these items are allocated in the same fashion. The costs of subsidies and grants paid by the Commonwealth Government are allocated according to the individual purposes of such payments. The great majority of these costs relate to coastal services. The costs allocated to particular areas of operation by each of these methods are summed, and the percentages derived in these processes used to apportion the remaining Commonwealth Government costs between coastal and international services.

Costs incurred by State Governments are allocated on the same basis as that used to allocate revenues to these organisations. Thus, State Government payments to ports and harbours authorities are allocated according to the division of costs incurred by these agencies in carrying out their usual operations. Payments made by the Western Australian State Government to fund the StateShips trading deficit are fully allocated to coastal sea transport.

Costs incurred by private-enterprise shipping lines are allocated in the same way as revenues - that is, on the basis of published reports. ANL's annual report provided comprehensive data on the breakdown of costs for 1974-75. This information was used as the basis for allocating ANL's operating costs. Capital costs are allocated to ANL's coastal shipping services according to the volumes of cargo carried in those services compared to the total volume carried on all services. As in the case of revenues, all costs for other shipping lines examined in the study are allocated fully to coastal services.

Capital costs attributed to the ports and harbours authorities are allocated according to the relative proportions of coastal and international berthings, because port facilities are planned to service the number and type of vessels expected to berth. Therefore, capital expenditure related to particular types of services can be allocated according to the numbers of berthings related to such services. This is accepted as a reasonable measurement method, but is should be emphasised that it is not necessarily a suitable basis for decisions on pricing and other economic issues. Since daily operating costs largely depend on the volume of cargo handled, operating costs are allocated on the basis of the respective tonnages of cargo carried by coastal and international ships.

Data Sources

As implied in the earlier sections of this Chapter, a great variety of data sources was employed in the analysis of sea transport. The amount of detail available from published reports differed markedly from organisation to organisation, and appeared to be independent of the functions of particular organisations.

Analysis of the Department of Transport's operations was largely performed using information derived from internal unpublished material provided by the Finance and Commercial Division and the Sea Transport Policy Division. Figures relating to the sea transport tasks performed in various areas of operation were obtained from the Department of Transport's annual report, bulletins from the Australian Bureau of Statistics[(1)] and from an earlier BTE publication[(2)]. Valuable assistance was provided by the Australian Stevedoring Industry Authority, which helped to prepare detailed information for revenue allocations at the Australian ports served by registered stevedores.

The annual reports published by State departments and instrumentalities and independent ports and harbours authorities comprised the bulk of the other information which was used in the study. In some instances, State Auditor-Generals' reports were also valuable in filling gaps in other published information. Because of the very large number of these reports used in the study, they have not all been itemised. In general, the reports used for these purposes also provided information on State Government revenues and costs related to sea transport. Relevant financial data had not been published by the Northern Territory Port Authority, due to the disruption caused by Cyclone Tracy in December 1974. In addition, data on the operation of privately-owned ports could not be separated out from the financial statements of multi-enterprise companies' annual reports. Despite these deficiencies, annual reports were available for authorities which handled 82 per cent of the total cargo discharged and loaded at Australian ports in 1974-75[(3)]. Under the reasonable assumption that the cost to cargo and revenue to cargo ratios were the same in relation to the other 18 per cent of throughput, costs and revenues for ports and harbours for which suitable data were available are extrapolated to provide figures for all cargo movements.

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(1) ABS, Overseas and Coastal Shipping 1974-75, and Passenger Movement by Sea at Australian Ports 1974.
(2) BTE, Estimates of the Australian Freight Traffic Task 1960-61 to 1974-75, Information Paper 1976.
(3) Derived from ABS, Overseas and Coastal Shipping 1974-75, p.15.

Information on the operations of ANL was contained in the 1974-75 annual report of the Australian Shipping Commission.[1]

Information detailing the revenues of coastal operators was obtained from a number of sources. Non-bulk freight rates were obtained from ABS[2] and bulk rates from the Department of Transport's Sea Transport Policy Division. Cost information was predominantly obtained from published Department of Transport figures[3] and from Drewry's work on shipping statistics and economics[4].

Information on capital expenditure in 1974-75, and on expenditure series over previous years, was obtained from the Australian National Accounts[5]. This information was supplemented and verified by data obtained from annual reports and other sources[6].

RESULTS AND CONCLUSIONS - SEA TRANSPORT

Estimates of revenues and costs for sea transport are derived using the methods described in the earlier parts of this Chapter. These estimates are presented in Tables 5.3 and 5.4. Table 5.3 gives detailed revenues and costs for coastal sea transport, while Table 5.4 gives the corresponding figures for international sea transport. Each table shows revenues and costs for the Commonwealth Government sector, the State Government sector, the 'other'

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(1) Australian Shipping Commission, Annual Report 1975 - The Australian National Line.
(2) ABS, Quarterly Summary of Australian Statistics, No. 298, December 1975, p. 51.
(3) Department of Transport, Australian Shipping and Shipbuilding as at 30 June 1975, AGPS, Canberra, 1975.
(4) H.P. Drewry (Shipping Consultants) Ltd., London, Shipping Statistics and Economics, No. 56, June 1975.
(5) ABS, Australian National Accounts: Income and Expenditure 1974-75, Canberra, 1976.
(6) And particularly from within the BTE.

TABLE 5.3 - SEA TRANSPORT REVENUES AND COSTS - COASTAL OPERATIONS PASSENGER AND FREIGHT COMBINED - 1974-75

Sources of Revenues & Costs	Commonwealth Government			State [a] Government		
REVENUES ($M)						
Light Dues	1.0			-		
Mercantile Marine Fees	0.2			-		
Oil Pollution Levy				-		
Pt Wilson Charges				-		
Payroll/Company Tax	-			1.3		
Dividends/Interest [b]	-			8.5		
Fares, Freight Charges etc.	-			-		
Subsidies and Grants	-			-		
Wharfage, Tonnage, Rents, etc.	-			-		
TOTAL REVENUES ($M)	1.2			9.8		
COSTS ($M)	HC [c]	IHC [d]	ICC [e]	HC [c]	IHC [d]	ICC [e]
Depreciation	0.5	0.5	-	-	-	-
Interest	0.9	2.0	1.7	-	-	-
Operating Costs	11.4	11.4	11.4	1.5	1.5	1.5
Grants/Loans/ Subsidies(f)	3.2	3.2	3.2	11.7	11.7	11.7
Company Tax	-	-	-	-	-	-
TOTAL COSTS($M)	16.0	17.1	16.3	13.2	13.2	13.2

(a) The 'State Government' sector exlcudes the operations of ports and harbours authorities, but includes all transfer payments to and from State Treasuries for sea transport activities.
(b) Interest receipts only include interest on loans raised within Australia. Dividends include payments made by statutory authorities to State Treasuries.
(c) Indicates the Historical Cost method of treating capital costs.
(d) Indicates the Indexed Historical Cost method of treating capital costs.
(e) Indicates the Incurred Capital Cost method of treating capital costs.
(f) Grants also include deficit fundings.

TABLE 5.3 - (CONT) SEA TRANSPORT REVENUES AND COSTS - COASTAL OPERATIONS - PASSENGER AND FREIGHT COMBINED - 1974-75

Sources of Revenues & Costs	Other			Port & Harbour Authorities		
REVENUES ($M)						
Light Dues	-			-		
Mercantile Marine Fees	-			-		
Oil Pollution Levy	-			-		
Pt Wilson Charges	-			-		
Payroll/Company Tax	-			-		
Dividends/Interest[(a)]	-			-		
Fares, Freight Charges etc.	277.5			-		
Subsidies and Grants	3.2			2.5		
Wharfage, Tonnage, Rents, etc.	-			58.4		
TOTAL REVENUES ($M)	280.7			60.9		
COSTS ($M)	HC[(b)]	IHC[(c)]	ICC[(d)]	HC[(b)]	IHC[(c)]	ICC[(d)]
Depreciation	25.6	42.1	-	5.7	14.4	-
Interest	69.0	77.2	4.6	29.0	59.0	11.6
Operating Costs	367.1	367.1	367.1	29.8	29.8	29.8
Grants/Loans/ Subsidies	-	-	-	-	-	-
Company Tax	-	-	-	-	-	-
TOTAL COSTS ($M)	461.7	486.4	371.7	64.5	103.2	41.4

(a) Interest receipts only include interest on loans raised within Australia.

(b) Indicates the Historical Cost method of treating capital costs.

(c) Indicates the Indexed Historical Cost method of treating capital costs.

(d) Indicates the Incurred Capital Cost method of treating capital costs.

TABLE 5.4 - SEA TRANSPORT REVENUES AND COSTS - INTERNATIONAL OPERATIONS - PASSENGER AND FREIGHT COMBINED - 1974-75

Sources of Revenues & Costs	Commonwealth Government			State[a] Government		
REVENUES ($M)						
Light Dues		14.6			-	
Mercantile Marine Fees		0.1			-	
Oil Pollution Levy		0.5			-	
Pt Wilson Charges		0.1			-	
Payroll/Company Tax		-			3.2	
Dividends/Interest[b]		0.1			21.5	
Fares, Freight Charges etc.		-			-	
Subsidies and Grants		-			-	
Wharfage, Tonnage, Rents, etc.		-			-	
TOTAL REVENUES ($M)		15.4			24.7	
COSTS ($M)	HC[c]	IHC[d]	ICC[e]	HC[c]	IHC[d]	ICC[e]
Depreciation	0.8	0.8	-	-	-	-
Interest	1.4	2.9	2.5	-	-	-
Operating Costs	9.4	9.4	9.4	3.5	3.5	3.5
Grants/Loans/ Subsidies(f)	-	-	-	9.7	9.7	9.7
Company Tax	-	-	-	-	-	-
TOTAL COSTS ($M)	11.6	13.1	11.9	13.2	13.2	13.2

(a) The 'State Government' sector exlcudes the operations of ports and harbours authorities, but includes all transfer payments to and from State Treasuries for sea transport activities.

(b) Interest receipts only include interest on loans raised within Australia. Dividends include payments made by statutory authorities to State Treasuries.

(c) Indicates the Historical Cost method of treating capital costs.

(d) Indicates the Indexed Historical Cost method of treating capital costs.

(e) Indicates the Incurred Capital Cost method of treating capital costs.

(f) Grants also include deficit fundings.

TABLE 5.4 - (CONT) SEA TRANSPORT REVENUES AND COSTS - INTERNATIONAL OPERATIONS - PASSENGER AND FREIGHT COMBINED - 1974-75

Sources of Revenues & Costs	Other (a)	Port & Harbour Authorities		
REVENUES ($M)				
Light Dues			-	
Mercantile Marine Fees			-	
Oil Pollution Levy			-	
Pt Wilson Charges			-	
Payroll/Company Tax			-	
Dividends/Interest			-	
Fares, Freight Charges etc.			-	
Subsidies and Grants			5.4	
Wharfage, Tonnage, Rents, etc.			147.3	
TOTAL REVENUES ($M)			152.7	
COSTS ($M)		HC (c)	IHC (d)	ICC (e)
Depreciation		8.2	20.7	-
Interest		41.7	84.8	16.8
Operating Costs		99.6	99.6	99.6
Grants/Loans/ Subsidies		-	-	-
Company Tax		-	-	-
TOTAL COSTS($M)		149.5	205.1	116.4

(a) International shipping operations are excluded from the analysis.
(b) Interest receipts only include interest on loans raised within Australia.
(c) Indicates the Historical Cost method of treating capital costs.
(d) Indicates the Indexed Historical Cost method of treating capital costs.
(e) Indicates the Incurred Capital Cost method of treating capital costs.

sector (i.e. the sector covering private enterprise shipping lines) and the ports and harbours sector. The figures are presented in this way to simplify indentification of transfer payments and so on. Tables 5.3 and 5.4 are both divided into two parts for presentation purposes.

As in the case of air transport, the nature of these tables of revenues and costs warrants some comment. They are not the same as 'balance sheets', since they give actual revenues and costs, and do not include balancing costs items such as dividends for private enterprise shipping lines. Such payments would normally be made to agencies or individuals external to the frame of reference adopted for this study. However, even this system leads to some specific problems in the case of sea transport. In the study year, both ANL and StateShips operated at losses. In the normal 'balance-sheet' fashion, a revenue item (the nature of which would relate to the way in which the deficit was funded in each case) would be entered to ensure a balance was struck. However, these balancing items are inappropriate to this study, since they would lead to an implication of 100 percent cost recovery for ANL and StateShips. Therefore, the balancing revenue terms involved in deficit funding in such cases have been omitted in Tables 5.3 and 5.4. Nonetheless, the fact remains that both ANL(1) and StateShips drew on the resources of their respective governments to fund their deficits. Therefore, the amounts to which deficit funding was undertaken by the Commonwealth and Western Australian State Governments are included as legitimate costs to these governments. The same situation prevailed in the case of some ports and harbours authorities, and a similar approach is adopted in dealing with these problems. Conversely, there are cases in which State Governments received dividends from their related ports and harbours authorities. In such cases, the amounts of dividends are not treated as costs to the authorities involved,

(1) In fact, ANL funds its deficit by loan raisings, so that the link in this regard is not as clear as in the case of StateShips.

but as legitimate revenues to the respective State Governments. This is completely analogous to the practice adopted in the cases of TAA and QANTAS and their financial relationship to the Commonwealth Government.

Interest and capital repayments by particular agencies are included as legitimate costs to those agencies. However, payments of this nature to the Commonwealth or State Governments are only included as revenues to a government if the particular government is the actual source of the loan involved. In some cases, Governments effectively only act as agents for capital-broking purposes. This is especially so when government-guaranteed loans are negotiated by governments on behalf of particular operating agencies. Although this practice certainly involves some financial advantage to the recipients of such loans, it is impossible to estimate either the source or extent of such advantage. In regard to the loan repayments themselves, they could be considered as transfers <u>through</u> the relevant governments (and in some cases, even this may not be the case if repayments are made directly to the lenders). Therefore, repayments on loans of this nature are not included as revenues to governments. Similarly, balancing cost items are not included in the two government sectors. As stated above, such payments are included as costs to the end users of the funds.

Three different sets of values for costs are presented in Tables 5.3 and 5.4. These three sets of costs relate to the three different methods of treating capital costs (as described in Annex A). The values for depreciation and interest items presented in Tables 5.3 and 5.4 are also actually described in Annex A. The other cost elements (operating costs, company tax and payroll tax) do not, of course, vary with the method chosen to value capital assets. It is worth mentioning at this stage that payroll tax (which was not treated explicitly in the case of air transport) has been included explicitly in the sea transport analysis as a direct result of the inclusion of a 'State Government' sector.

International sea transport has not been examined in relation to the 'other' sector. However, the implications of international sea transport for the Commonwealth Government, State Governments and ports and harbours authorities were analysed. The data deficiencies which forced the BTE to omit international sea transport operations by private-enterprise carriers, including ANL, have been described previously.

After revenues and costs had been fully determined in line with the procedures detailed above, they were applied to the 'practical' framework outlined earlier and shown in Figure 5.2. Table 5.5 shows details of cost recovery by the Commonwealth Government in terms of that framework. Again, three sets of cost recovery figures are presented to reflect the three different methods of treating capital costs. Cost recovery figures on the same basis for State Governments are given in Table 5.6, while corresponding figures for the 'other' sector are given in Table 5.7. In the case of the 'other' sector, international sea transport activities are excluded for the reasons given earlier. Cost recovery figures for the ports and harbours authorities are given in Table 5.8.

The final process in this stage of the analysis was to draw together the various sector results to obtain an overall view of sea transport cost recovery. This process was not simple. The fact that there are four separate sectors analysed in the study of sea transport led to a very complex intertwining of financial arrangements. In particular, extreme difficulty was encountered in determining the levels of transfer payments between sectors. This problem was exacerbated by the very broad range of financial measures used by various organisations for the purposes of raising loans, funding deficits and so on. However, the appropriate levels of transfer payments were ultimately identified, and overall revenues were calculated by adding revenues for all sectors and subtracting the transfer payments. Overall costs are determined in the same way. In fact, this could only be done for coastal sea transport, since the absence of results for the

TABLE 5.5 - SEA TRANSPORT COST RECOVERY SUMMARY - PRACTICAL FRAMEWORK[(a)] - COMMONWEALTH GOVERNMENT - 1974-75

Area of Operation	Class of Operation	Item	Values		
			HC[(b)]	IHC[(c)]	ICC[(d)]
COASTAL OPERATIONS	Passenger and Freight Combined	Revenues($m)	1.2	1.2	1.2
		Costs($M)	16.0	17.1	16.3
		Balance($m)	-14.8	-15.9	-15.1
		Cost Recovery	8%	7%	7%
INTER-NATIONAL OPERATIONS	Passenger and Freight Combined	Revenues($m)	15.4	15.4	15.4
		Costs(m)	11.6	13.1	11.9
		Balance($m)	3.8	2.3	3.5
		Cost Recovery	133%	118%	129%
ALL OPERATIONS	Passenger and Freight Combined	Revenues($m)	16.6	16.6	16.6
		Costs($m)	27.6	30.2	28.2
		Balance($m)	-11.0	-13.6	-11.6
		Cost Recovery	60%	56%	59%

(a) Indicates the institutional and organisational system of reporting shown in Figure 5.2.

(b) Indicates the Historical Cost method of treating capital costs.

(c) Indicates the Indexed Historical Cost method of treating capital costs.

(d) Indicates the Incurred Capital Cost method of treating capital costs.

TABLE 5.6 - SEA TRANSPORT COST RECOVERY SUMMARY - PRACTICAL FRAMEWORK[(a)] - STATE GOVERNMENT - 1974-75

Area of Operation	Class of Operation	Item	Values		
			HC[(b)]	IHC[(c)]	ICC[(d)]
COASTAL OPERATIONS	Passenger and Freight Combined	Revenues($m)	9.8	9.8	9.8
		Costs($M)	13.2	13.2	13.2
		Balance($m)	-3.4	-3.4	-3.4
		Cost Recovery	74%	74%	74%
INTER-NATIONAL OPERATIONS	Passenger and Freight Combined	Revenues($m)	24.7	24.7	24.7
		Costs($m)	13.2	13.2	13.2
		Balance($m)	11.5	11.5	11.5
		Cost Recovery	187%	187%	187%
ALL OPERATIONS	Passenger and Freight Combined	Revenues($m)	34.5	34.5	34.5
		Costs($m)	26.4	26.4	26.4
		Balance($m)	8.1	8.1	8.1
		Cost Recovery	131%	131%	131%

(a) Indicates the institutional and organisational system of reporting shown in Figure 5.2.
(b) Indicates the Historical Cost method of treating capital costs.
(c) Indicates the Indexed Historical Cost method of treating capital costs.
(d) Indicates the Incurred Capital Cost method of treating capital costs.

TABLE 5.7 - SEA TRANSPORT COST RECOVERY SUMMARY - PRACTICAL FRAMEWORK[(a)] - OTHER - 1974-75

Area of Operation	Class of Operation	Item	Values HC[(b)]	IHC[(c)]	ICC[(d)]
COASTAL OPERATIONS	Passenger and Freight Combined	Revenues ($m)	280.7	280.7	280.7
		Costs ($M)	461.7	486.4	371.7
		Balance ($m)	-181.0	-205.7	-91.0
		Cost Recovery	61%	58%	76%

(a) Indicates the institutional and organisational system of reporting shown in Figure 5.2.
(b) Indicates the Historical Cost method of treating capital costs.
(c) Indicates the Indexed Historical Cost method of treating capital costs.
(d) Indicates the Incurred Capital Cost method of treating capital costs.

TABLE 5.8 - SEA TRANSPORT COST RECOVERY SUMMARY - PRACTICAL FRAMEWORK[a] - PORTS AND HARBOURS - 1974-75

Area of Operation	Class of Operation	Item	Values HC[b]	IHC[c]	ICC[d]
COASTAL OPERATIONS	Passenger and Freight Combined	Revenues ($m)	60.9	60.9	60.9
		Costs ($M)	64.5	103.2	41.4
		Balance ($m)	-3.6	-42.3	19.5
		Cost Recovery	94%	59%	147%
INTER-NATIONAL OPERATIONS	Passenger and Freight Combined	Revenues ($m)	152.7	152.7	152.7
		Costs ($m)	149.5	205.1	116.4
		Balance ($m)	3.2	-52.4	36.3
		Cost Recovery	102%	74%	131%
ALL OPERATIONS	Passenger and Freight Combined	Revenues ($m)	213.6	213.6	213.6
		Costs ($m)	214.0	308.3	157.8
		Balance ($m)	-0.4	-94.7	55.8
		Cost Recovery	100%	69%	135%

(a) Indicates the institutional and organisational system of reporting shown in Figure 5.2.
(b) Indicates the Historical Cost method of treating capital costs.
(c) Indicates the Indexed Historical Cost method of treating capital costs.
(d) Indicates the Incurred Capital Cost method of treating capital costs.

'other' sector in the international area of operation meant that a meaningful complete analysis could not be performed. The limited results of this analysis are given in Table 5.9.

As in the statements of cost recovery by individual sectors (Tables 5.5 to 5.8), the results in Table 5.9 contain three sets of figures reflecting the different methods of treating capital costs. Table 5.9 could be regarded as an estimate of the extent to which end users of coastal sea transport meet the costs of providing such services. However, the limitations detailed in Chapter 4 for the corresponding air transport figures should be noted in regard to the sea transport results as well.

In their own right, there is little to be said about the figures given in Tables 5.5 to 5.9. As would be expected, the different methods of treating capital costs had a profound influence on apparent levels of cost recovery. The BTE's preferences for the indexed historical cost (IHC) method as a measure of resource use and for the incurred capital cost (ICC) method as a measure of short-term financial viability have already been laid down in relation to the study of air transport. The same considerations apply to sea transport.

Formal across-the-board studies of cost recovery in sea transport have not been performed before. However, it is probably true to say that the results of this BTE study are rather harsher than those which could be encountered in other studies which might be undertaken. In particular, the BTE's approach of regarding virtually all costs to the various sectors as being attributable to sea transport would not be a common practice. However, equity questions such as those raised by regulatory and licensing functions have been deemed to be outside the realm of this analysis, at least in terms of the theoretical basis developed in Chapter 3. It is fully accepted that there are externalities which could affect the desirability of attributing all such costs to sea transport (or to any other mode, for that matter). However, this

TABLE 5.9 - SEA TRANSPORT COST RECOVERY SUMMARY - PRACTICAL FRAMEWORK[a] - OVERALL - 1974-75

Area of Operation	Class of Operation	Item	Values HC[b]	IHC[c]	ICC[d]
COASTAL OPERATIONS	Passenger and Freight Combintd	Revenues ($m)	335.9	335.9	335.9
		Costs ($M)	531.8	595.8	418.5
		Balance ($m)	-195.4	-259.9	-82.6
		Cost Recovery	63%	56%	80%

(a) Indicates the institutional and organisational system of reporting shown in Figure 5.2.
(b) Indicates the Historical Cost method of treating capital costs.
(c) Indicates the Indexed Histrical Cost method of treating capital costs.
(d) Indicates the Incurred Capital Cost method of treating capital costs.

issue is regarded as being beyond the terms of reference of this study.

The figures given in Tables 5.5 to 5.9 are related to the formal structure of the study in Chapter 8 of this Report.

CHAPTER 6 - COST RECOVERY IN ROAD TRANSPORT 1974-75

ROAD TRANSPORT STRUCTURE AND TASKS

Road transport is without question the major form of transport in Australia. Virtually every work-place and residence in the country is accessible by road. Vehicle ownership (and perhaps more importantly, vehicle access) is consequently very high. Over six million road vehicles were registered in Australia in 1974-75. On a per capita basis, this figure is amongst the highest in the world. Because of the large and widespread incidence of road transport infrastructure and vehicles, the structure of road transport is particularly complex and involves all levels of government, private enterprise and associated organisations and private individuals.

The Commonwealth Government is wholly responsible for provision and maintenance of roads within the Federal territories (that is, the ACT and the Northern Territory). The Commonwealth Government also regulates the use of these roads directly through its legislative mechanisms. However, in addition to its role in providing and regulating road transport within the territories for which it has fundamental administrative and legislative responsibility, the Commonwealth Government also plays a significant role in various other aspects of road transport. Under the National Roads Act 1974 and the Roads Grants Act 1974, the Commonwealth Government provides funds to the States for both urban and rural roads within State boundaries. In addition, it grants money to the States for urban public transport under the States Grants (Urban Public Transport) Act 1974. Although a large proportion of the funds available under this latter Act are used for improvements to urban rail transport, there is a significant component which relates to the provision of buses and trams and associated facilities. In combination, the amount of funding undertaken by the Commonwealth Government through these three Acts is substantial. Therefore the Commonwealth Government must be regarded as having an important role in the provision of Australian road transport infrastructure.

In line with the general responsibilities of governments involved in administration of states or territories, the Commonwealth Government also provides and operates bus services in the ACT and Northern Territory. While these services are relatively small compared to those operated in the major capital cities they are still a substantive part of the Commonwealth's involvement in road transport. The Commonwealth Government also operates very large fleets of vehicles associated with activities of the Public Service. Foremost amongst these would be the fleets operated by the Armed Services, the Australian Postal Commission and the Stores and Transport Branch of the Department of Administrative Services, but other Commonwealth Government departments and statutory bodies also operate and maintain substantial vehicle fleets.

State Governments also have an important role in road transport. In essence, this role is in general terms largely parallel to that of the Commonwealth Government, but related to the geographical areas over which the respective State Governments have administrative control. Thus, State Governments, through their roads authorities, provide and maintain all roads declared to be under their control[(1)]. In addition, these roads authorities administer grants to Local Governments for the purpose of performing works on roads which are not classified as coming under the aegis of the Acts which established such authorities. Thus, with regard to road transport infrastructure, State Governments have roles which cover policy, maintenance and construction.

State Governments also have significant roles in operational fields. Most State Governments operate bus services, at least within capital cities or major urban areas. The actual nature of agencies operating such services varies from place to place (e.g.

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(1) This distinction is important. In some cases, roads within State boundaries are actually provided and maintained by organisations other than the relevant State Governments. A major example of this system is encountered in the case of 'declared National Roads', for which the Commonwealth Government has assumed primary responsibility.

commissions, departments and so on). There is also a corresponding variation in the financial and administrative relationships of such agencies to their respective State Governments. In view of this, these operational agencies should be treated separately from the State governments, since they generally operate on a more-or-less independent basis. In essence, the BTE considers that the operations of agencies providing bus and tram services are substantially different from those of the State Government departments (and their associated roads authorities) in providing road transport infrastructure. State Governments, as in the case of the Commonwealth Government, also operate substantial vehicle fleets related to the activities of their respective Public Services.

State Government departments or associated statutory or other bodies are also responsible for regulation and pricing within road transport, with this responsibility usually taking the form of registration charges and other taxes and motor vehicle control.

Local Governments also have a role in road transport. With regard to road transport infrastructure, this role is generally confined to provision and maintenance of roads within specific local government areas. However, this can involve significant allocation of funds, and is often the major area of expenditure by Local Government authorities. Local Governments are generally not specifically involved in the regulation of road transport, except in peripheral ways such as control of local parking and similar activities. Again, Local Government authorities often own and operate substantial vehicle fleets for various purposes. Some of these purposes relate to day-to-day administration of the affairs of the localities involved, but others are more specifically related to physical services provided by such Local Governments such as the transport of household and industrial refuse.

While this activity by all levels of governments within road transport is substantial, there is superimposed on it the massive level of private and commercial road transport activities. In the main, private road transport activity is largely operational, but it also contains some infrastructural elements. For example, private enterprise is frequently involved in the provision of parking stations and the development of residential street systems related to particular urban development programs. Also, it would be an oversimplification to ignore the massive investment in road-based industries such as service stations and other such facilities (including freight loading terminals and terminals for other road transport operations). As well as all this, the motor vehicle industry itself has a central place in the Australian economic structure. In, at least some senses, it is the largest single industry. While the BTE recognises that such activities are inextricably interwoven with road transport, it was felt that they were in some ways peripheral to the main thrust of this study. Therefore, they were not included in the analysis except where they could be identified as having a quite direct relationship to road transport infrastructure.

Even within this relatively limited definition of road transport, the largest single area of activity is undoubtedly private road transport operations. These range from private motoring for business and pleasure purposes to large-scale freight transport operations. In many cases, an unusual feature of this whole spectrum of transport operations is that owners of vehicles also tend to be operators. Consequently, actual financial exchanges for the services of such operations frequently do not occur. This contrasts directly with hire-and-reward operations where the operator of the vehicle is not necessarily the owner, and hence actual labour costs are involved in vehicle operation.

Private firms, as well as operating diversified freight transport services, also provide bus services in many areas. Frequently, such commercial bus services tend to be on a relatively small scale individually, but in total they are quite large, especially in outer urban areas. All sorts of manufacturing, wholesaling and retailing firms also operate ancillary road transport fleets, either for distributing goods or in support of their day-to-day administrative activities.

From the description above, it can be seen that road transport is an important economic factor in Australia, and that it has a very complex organisational structure. Accordingly, it is particularly difficult to determine statistical measures which can be used to describe road transport. However, Table 6.1 shows estimates of the tasks performed in road transport in Australia in 1974-75. The figures included in Table 6.1 relate to specific identifiable operations. For example, the road freight transport figures relate to services provided by identifiable freight transport operators. While they include some estimates of ancillary transport operations, the BTE certainly would not claim that such operations are covered fully. Similar restrictions apply to other values given in the Table. Nevertheless, it is possible to draw some broad conclusions from Table 6.1. For instance, hire-and-reward road transport operations account for more than two-thirds of all domestic hire-and-reward passenger transport operations. Another interesting comparison is that road length in urban areas is 52% of the total road length in Australia as a whole, although more than 64% of total vehicle kilometres are performed on these roads. Nevertheless, urban areas only account for 48% of the road passenger transport task, in terms of passenger kilometres travelled. This discrepancy is possibly due to higher vehicle occupancy rates in rural areas. In this context it is estimated that over 20,000 buses operate in rural areas. One of the main tasks of this large bus fleet is to carry school-children to and from the hinterland of rural centres(1). This type of operation typically has high vehicle

(1) The large scale of this operation reinforces the importance of the points made earlier in this Report about the importance of specific financial transfers between education and welfare authorities and transport operation authorities.

TABLE 6.1 - ROAD TRANSPORT STATISTICS[a] 1974-75

Item	Urban	Non-Urban	Total
Road Length ('000 km)	820	760	1580
Vehicles Registered ('000)			
. Motor cars/station wagons	3129.1	1640.1	4769.2
. Trucks and light commercial vehicles	n.a.	n.a.	1101.7
. Motor Cycles	n.a.	n.a.	274.5
Passenger-km ('000 millions)	81	86	167
Freight Tonne-km ('000 millions)	13	20	33
Passenger Vehicle-km ('000 millions)	57	32	89
Freight Vehicle-km ('000 millions)	7	6	13
Freight Tonnes Carried ('000 millions)	n.a.	n.a.	920

(a) Sources: BTE Transport Information Bulletin, June Quarter 1976, Vol 1, No. 2.
Commonwealth Bureau of Roads, Roads in Australia 1975, Melbourne 1975.

occupancies combined with fairly long distances, and therefore comprises a substantial task in terms of passenger kilometres.

It is difficult to generalise about the position of road transport in Australia. In contrast with every other mode, there is no particular degree of specialisation involved in road transport. Road transport of both passengers and freight tends to be very responsive to demand, and any lags involved in this response tend to be short. This is witnessed by the ready way in which road freight transport vehicles and operations will adjust themselves to prevailing economic or regulatory circumstances. Therefore road transport can be expected to maintain its existing position, and possibly to improve it, as time goes on. This is not to say that advances in the standard of road infrastructure and in approaches to such important matters as pricing and regulation will not change the nature of road transport. However, there has been an increasing tendency to develop specific policies directed to pricing and regulation of road transport in its own right. This is in direct contrast to earlier attitudes to road transport policies, which were frequently directed towards reducing competition with other modes (and particularly with rail transport). It is only more recently that the whole question of transport pricing has come under scrutiny from a true multi-modal viewpoint.

Both improving infrastructure standards and more appropriate regulatory and pricing mechanisms will tend to lead to more efficient road transport. Whether this will reinforce the dominant position of road transport in the Australian transport field is open to question, since the continuing level of this dominance also depends on circumstances many of which are external to the road transport area itself. Some of these external factors are becoming increasingly evident in public debate about pollution, congestion, accidents and freeway development. However, most of these issues involve non-pecuniary transfers This puts them outside the scope of this study.

ORGANISATION OF THE STUDY OF ROAD TRANSPORT

The first stage in developing a suitable framework for analysing cost recovery in road transport was to attempt to apply the detailed task definition system derived in Chapter 1 to this mode. Clearly, not all of the possibilities outlined in Chapter 1 apply to road transport. In particular, the 'international' area of operation does not exist in the case of road transport in Australia. However, the other areas of operation ('Urban' and 'Non-Urban Domestic') do apply to road transport, as do all the classes of operation and sectors undertaking cost recovery shown in Figure 1.1. Actually, the problem in fitting the formal structure of Figure 1.1 to road transport is encountered mostly through that structure's inability to cover the breadth of road transport activities. This is in direct contrast to the situation with the other modes, where the formal structure was rather too comprehensive in most cases. In the event, the general system of task definition developed in Chapter 1 was finally applied to road transport, giving a formal structure for the study of road transport cost recovery along the lines of that shown in Figure 6.1.

With one major exception, the formal structure shown in Figure 6.1 is reasonably well aligned with the way in which road transport is organised on an institutional basis in Australia. The major exception is that there is a vast amount of road transport activity which does not fall into the general framework of this study at all. The most obvious manifestation of this problem is in the ownership and use of private motor vehicles (particularly cars). This particular group of activities perhaps has its closest parallels in general aviation and general (leisure, etc) marine operations, but it is on a much greater scale than either of these. There is no parallel at all in the case of rail transport. This problem is not confined to private motor vehicles. In fact, the ancillary road transport operations of governments and firms also fall into the same category. In general, there are clearly notional benefits which accrue to the use of vehicles for all these purposes, but these notional benefits are rarely

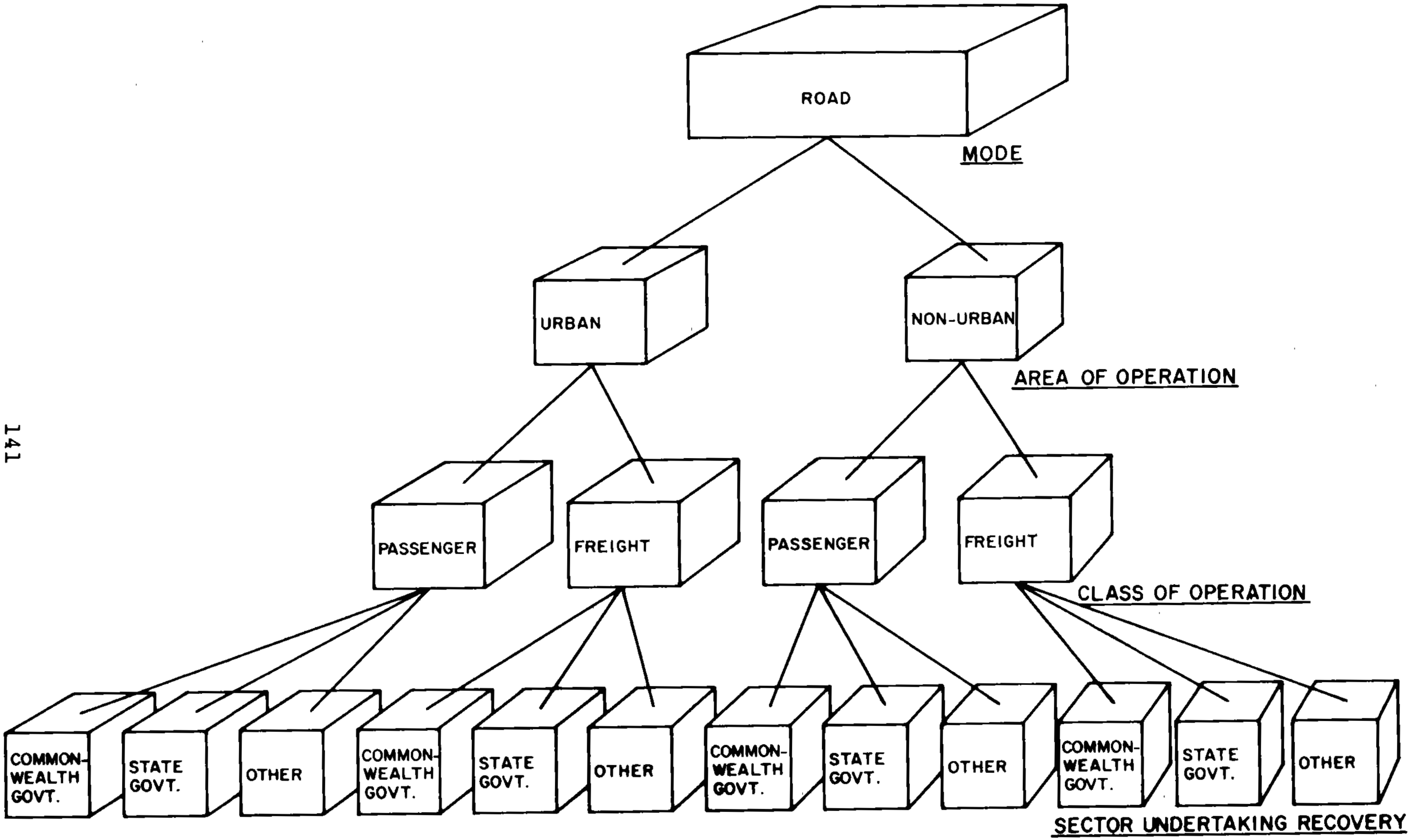

FIGURE 6·1
FORMAL STRUCTURE FOR REPORTING COST RECOVERY FIGURES IN ROAD TRANSPORT

(if ever) translated into actual cash transfers. Therefore, the BTE was faced with the problem of analysing a situation in which an extremely large part of road transport (and, indeed, of transport as a whole) in Australia is not operated on an identifiable financial basis. This problem is not encountered, of course, in the case of specific commercial or quasi-commercial road transport undertakings, in which revenues from such operations are 'visible' and real. Ways in which this problem impinged on other parts of the study (and particularly on attribution of costs) are outlined later in this Chapter, together with the measures introduced to overcome it.

Notwithstanding this substantial deviation from the main framework of the study, a suitable organisational structure for the study of road transport was eventually derived. The elements of this organisational structure are presented in Table 6.2. The 'practical' framework resulting from this is shown in Figure 6.2, and does not differ in general format from the formal structure shown in Figure 6.1. It can be seen that a full set of sectors ('Commonwealth Government', 'State Government' and 'Other') is included in the study. Each of these sectors is analysed in terms of its cost recovery from passenger and freight activities within the urban and rural[1] areas of activity. However, the 'other' sector is divided into 'infrastructure' and 'operations' subsectors. This was done for several reasons, and is discussed further on in the text. One major reason for this variation is that the 'other' sector contains significant elements of infrastructure and operations, as defined for the purposes of this study.

Because of the added complexities of road transport cost recovery, when compared to the other modes, it is fairly important to precisely define those activities which are covered by each sector. The 'Commonwealth Government' sector covers the activities of various Commonwealth agencies in providing roads infrastructure. This includes activities of the Department of Trans-

(1) The term 'rural' is used rather than 'non-urban domestic' in this context because it reflects common roads nomenclature.

TABLE 6.2 - ORGANISATIONAL STRUCTURE FOR ROAD TRANSPORT

Attribute	Classification	Notes and Comments
MODE	Road	
AREA OF OPERATION	Urban Rural	
CLASS OF OPERATION	Passenger	Analysed for all areas of operation.
	Freight	Analysed for all areas of operation.
SECTOR UNDERTAKING RECOVERY	Commonwealth Government	As a provider of roads infrastructure. Excludes ancillary operations.(a)
	State Government	As a provider of roads infrastructure. Excludes ancillary operations.(a)
	Other	See text, especially for treatment of private and ancillary operations. Broken into 'infrastructure' and 'operations' subsectors.

(a) Operations for purposes other than hire-and-reward.

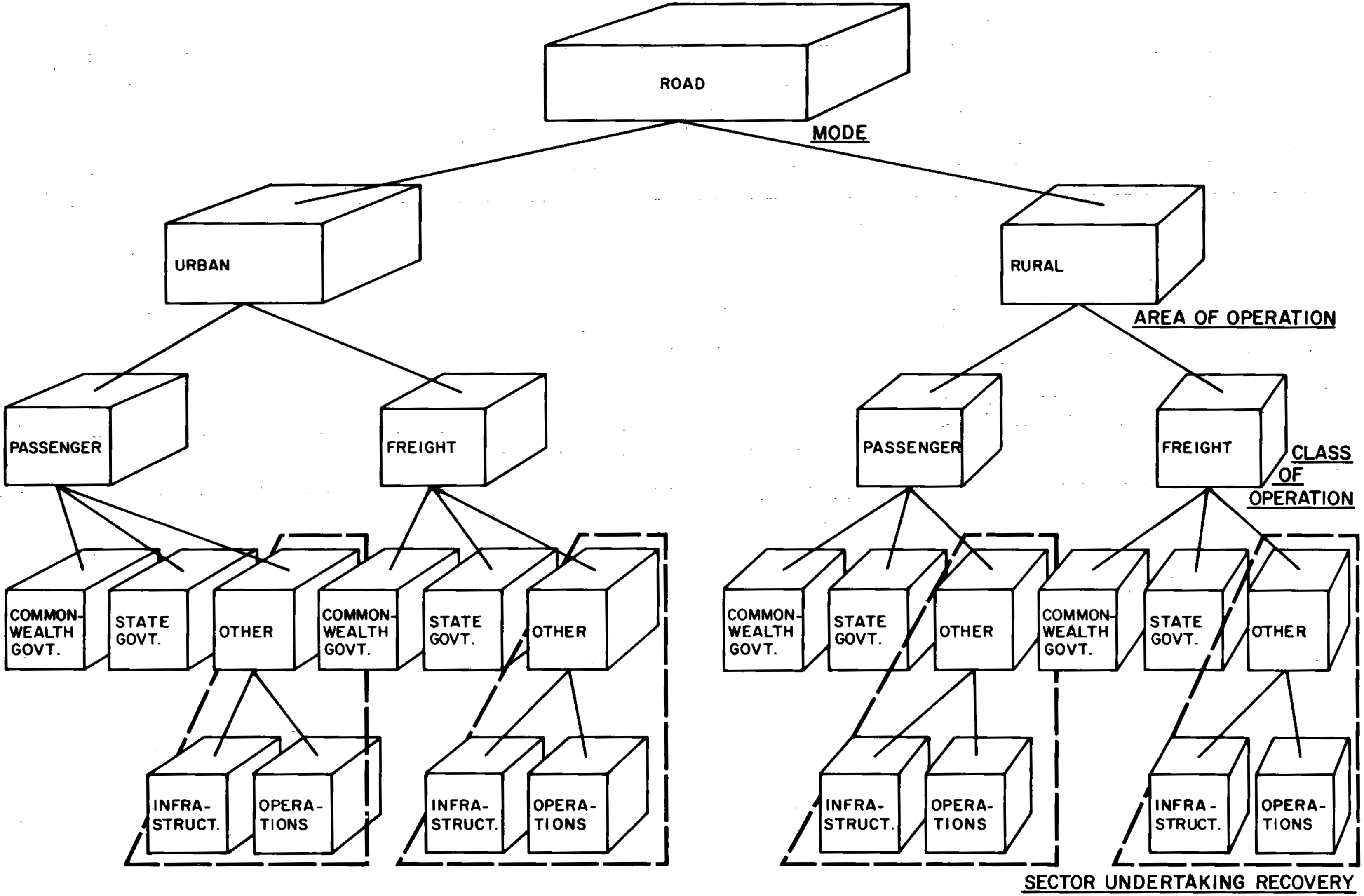

FIGURE 6·2 PRACTICAL FRAMEWORK FOR ANALYSING COST RECOVERY IN ROAD TRANSPORT

port, the Department of Capital Territory and the National Capital Development Commission, the Department of Northern Territory, the Department of Construction and the Commonwealth Bureau of Roads, amongst others. The Commonwealth Government also receives revenues from excise on fuel sales, as well as from sales tax on motor vehicles and parts[(1)]. Revenues are also received from motor vehicle registrations and driver licencing in the ACT and Northern Territory. However, activities of the Commonwealth Government in supporting and taxing industries associated with motor vehicle production, repair and so on are excluded from the study, since the BTE considers that such activities are not specifically related to transport. They are more appropriately considered as matters of general industrial or economic infrastructure. Similarly, Commonwealth Government activities relating to auxiliary industries (perhaps the most important of these being fuel production and distribution) are excluded on the same basis. The large-scale road transport systems run by the Commonwealth Government in support of the Armed Services and the Public Service generally are also excluded from the study, because they are not in the nature of 'identifiable' transport operations for which financial revenues can be defined. Nor does the Commonwealth Government 'pay itself' excise or other taxes or charges related to such operations. The bus services provided by the Commonwealth Government in the ACT and the Northern Territory are included in the study. However, they are treated as operations in the 'other' sector. The BTE decided on this course since such services are operated on a quasi-commercial basis, and are therefore analogous to TAA, QANTAS and ANL, and are treated effectively as commercial organisations. The Commonwealth Government role in providing such services is therefore limited (for the purposes of this study) to the policy and associated financial aspects of such systems, and does not include actual operational matters.

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(1) These are regarded as legitimate revenues to the Commonwealth as described in Chapter 3, even though the actual operations from which they are collected may not be analysed in this study.

The 'State Government' sector activities, in terms of this study, very closely parallel those of the Commonwealth Government. State Governments have primary responsibility for provision of roads infrastructure, and for regulatory and pricing matters. They incur costs for those activities, and they have associated sources of revenue. Ancillary services run by State Governments are excluded from the study for the reasons given earlier[(1)]. The quasi-commercial State bus services are included in the study, but are treated in the 'other' sector for the usual reasons.

As mentioned earlier, the 'other' sector was divided into 'infrastructure' and 'operations' subsectors. The 'infrastructure' subsector covers the activities of Local Government as they apply to road transport. This usually involves provision and maintenance of local roads and associated facilities. In essence, this activity is parallel to that of the Commonwealth and State Governments, but on a much more fragmented basis. Ancillary road transport operations by local government authorities are excluded from the study, on the basis mentioned earlier (except for payment to other sectors), but bus services operated by such authorities are included in the 'operation' subsector. Private enterprise road developments (as in new urban developments) are included indirectly, since such roads are generally handed to Local Government for future maintenance and so on, and hence appear in the relevant financial statements (albeit indirectly). On the same basis, ancillary private enterprise road transport activities (that is, those which are performed entirely in support of non-transport objectives, and not those performed for hire-and-reward by identifiable commercial road transport operators) are excluded (with the usual exception that excise and other such payments to governments within the framework are included as legitimate revenues to such Governments).

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(1) Again, however, any payments to, say, the Commonwealth Government, related to such services and are included as legitimate revenues to the Commonwealth.

The 'operations' subsector covers all identifiable commercial or quasi-commercial road transport operations. These include scheduled bus services operated by Commonwealth, State and Local Governments and private enterprise. They also include, of course, freight operations by commercial freight organisations. In a sense, the 'operations' subsector could be regarded as covering road transport operations which are performed fundamentally for hire-and-reward purposes.

The glaring omission in this description of the practical framework adopted for the study of road transport is that of private motor vehicles which are not essentially operated for hire-and-reward purposes. It has already been mentioned that these operations are analogous to general aviation and general marine activities. Also, the approach adopted for ancillary operations has been described in passing. However, all this ignores the fact that private motor vehicle operations are very important, and warrant treatment in more detail.

The BTE's view is that private motor vehicle operation is essentially outside the framework of this study. This statement is not made merely to sidestep a difficult issue, but has sound philosophical grounds. In every other mode of transport, the major services are offered to the public through marketing agencies of various sorts (airlines, railways and so on). Whether such agencies operate at a profit or not is irrelevant in this sense. The fact is that such agencies form an identifiable interface between a complex background organisational structure and an individual user. The same applies for commercial road freight transport, where an end user of a transport service pays one fee to one organisation, and need not be aware of the complex organisational structure which leads to the setting of that fee. However, this system breaks down when private (i.e. not hire-and-reward) motor transport is considered.

The private motor vehicle operator is, in many senses, on his own. In essence, he is a user of the road system, rather than a user of a transport service. Such a user pays many separate fees to and through a wide range of organisations (e.g. licensing and registration fees directly to registrars, excise to the Commonwealth Government through service stations and fuel producers, and so on). Therefore, the BTE regards the private motorist and his vehicle as a unit which uses (and, through excise, sales taxes and so on, at least appears to pay for) roads infrastructure provided by government and other agencies. Payments such as depreciation, maintenance and repairs are made to notional or real agencies external to this study. The same situation applies to ancillary transport operations. In both cases, excise, sales tax, registration charges and licensing fees are included as revenues to the appropriate authorities. However, in simple terms, buying a car for private purposes is regarded as giving access to rather than purchasing transport service in itself. In some ways, purchase and maintenance of a car is equivalent to purchase and maintenance of an airline traveller's luggage. It is admitted that this distinction is complex and rather unsatisfactory. Nevertheless, the BTE considered it preferable to the alternatives available. These were as follows:

- To exclude all costs of private motoring, with a resultant understatement of payments such as excise and registration charges;

- To include all costs of private motoring in the 'operations' subsector. Since such costs would not have balancing revenue items in financial terms, this would lead to gross distortions in cost recovery levels.

Another, important transport operation omitted from the 'operations' subsector is that of taxi operators. To some extent, these operations suffer the problems outlined above. However, the main reason for their omission is simply lack of suitable comprehensive data. This situation could well change with the growing research and policy interest in this area.

In summary, the analysis of road transport covers cost recovery by three sectors. The first sector ('Commonwealth Government') encompasses the Commonwealth's activities in providing, maintaining and funding road systems in all parts of Australia. These activities include policy development and administration of various items of legislation under which grants are made to State Governments for road transport purposes. They also include financial transfers between the Commonwealth Government and its quasi-commercial bus services for purposes of deficit funding. The Commonwealth Government sector also includes collections by other Commonwealth agencies (such as the Treasury) through excise, sales tax and fees charged in the Federal territories. The second sector ('State Government') covers similar activities undertaken by State Governments.

The third sector ('Other') is divided into 'infrastructure' and 'operations' subsectors. The infrastructure subsector covers Local Government activities in providing and maintaining road networks. The operations subsector covers bus operations by all levels of government and private enterprise, and also includes commercial freight transport and other road transport activities. Private motoring and other road transport operations not specifically for hire-and-reward purposes are treated as outlined in earlier paragraphs.

METHODS ADOPTED IN THE STUDY OF ROAD TRANSPORT

Attribution - Revenues

Since the framework adopted for this study places fairly strict constraints on those elements of road transport which should be included, attribution of revenues to particular sectors was relatively complex. Each sector and subsector had to be treated on its merits, and particular revenue items had to be considered in line with the procedures outlined earlier in this Chapter.

The Commonwealth Government gathers revenue from a variety of sources within road transport. In line with the definitions given earlier, the following items are considered as fully-attributed revenues to the Commonwealth;

- Excise on fuel sales;
- Sales tax on motor vehicles, parts and accessories;
- Company tax payments by organisations involved in commercial road transport operations;
- Interest and repayments on loans to operating authorities;
- Motor vehicle registration fees and associated transport taxes (ACT and NT only);
- Driving licence fees (ACT and NT only);
- Suitable proportions of land rates in the ACT and NT (and of revenues from land sales in the ACT);
- Revenues from parking charges in the ACT and NT;
- Dividends from Commonwealth Government bus operations.[1]

In determining appropriate proportions of land rates which should be attributed as revenues from road transport activities, use was made of figures produced by the Local Government Association of NSW.[2] On this basis, 43 per cent of rates revenue was attributed as revenue offsetting provision of roads in local areas. For land sales in the ACT, a proportional attribution was based on known figures for costs of road construction relative to total land development costs. The rationale for including excise and sales tax has already been discussed in detail in Chapter 3. Although the BTE's approach is not in line with usual practice, there is little point in repeating the detailed arguments at this stage.

State Government revenues follow much the same pattern as the Commonwealth Government ones - this is, taxes, rates and specific charges. The main actual revenue items which are attributed to roads activities in this study are as follows:

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(1) Such dividends were not returned in the study year.
(2) Local Government Association of NSW, Financing of Roads in Built-up Areas, February 1969.

. Grants from the Commonwealth Government;
. Payroll tax payments by road transport organisations;
. Stamp duties and surcharges on third party insurance;
. Interest and repayments on loans to operating authorities and Local Governments;
. Contribution from Local Government authorities;
. Suitable proportions of property taxes;
. Motor vehicle registration fees and associated transport taxes;
. Tolls;
. Driving licence fees;
. Dividends from State Government bus operations(1).
. Road maintenance contributions by commercial road transport organisations.

In attributing property taxes, a figure of 50 per cent is used as an appropriate proportion for attribution to road activities. This proportion was derived from Clark's(2) estimate that one-half of the improved value of land is due to access provided by roads. This is clearly an arbitrary measure, but is used by the BTE in default of better indicators. Since property taxes are based on unimproved values, the same proportion (50 per cent)is applied to these taxes. It should perhaps be noted that some of these State revenue items (particularly registration fees) are hypothecated by law to road transport. It should also be noted that fines paid by motorists are excluded except where they were hypothecated to road transport by law.

Local Government revenues are effectively confined to the following items:

. Grants or contributions from Commonwealth and State Governments or their agencies;
. Rates;
. Parking charges.

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(1) As in the case of the Commonwealth Government, State Government bus services did not return profits in the study year.
(2) Nicholas Clark and Associates, Resources in Transport 1972-73, (unpublished).

These revenue items are used for the 'other' sector in relation to the 'infrastructure' subsector. Local Government rates revenues are attributed to roads activities using the same proportion (43 per cent) as described earlier for the Commonwealth Government. It should be noted that the mechanisms by which Local Government receive grants and contributions are complex and varied, but essentially fall into the categories outlined above.

For the 'operations' subsector, the types of revenue gathered are essentially the same as those for comparable operations in other modes. Some of these revenue items are as follows:

- Grants from Commonwealth and State governments;
- Fares, freight charges and associated revenues;
- Revenues from rentals, concessions and advertising;
- Operating subsidies.

It should be noted that the operations subsector covers a multitude of activities. Not all of the sources of revenue noted above would necessarily be available to each type of organisation. However, the list gives general sources of revenue to this subsector.

Attribution - Costs

The major area of costs for the Commonwealth Government in its administrative and policy role in road transport is in grants to the States for improvements to road systems. Such grants are made under various Acts mentioned earlier, including the States Grants (Urban Public Transport) Act 1974. This latter Act covers grants to bus systems, amongst other things. There is frequently a good deal of contention about the way in which grants of this type should be attributed and processed. Since major parts of such grants are intended for capital works purposes, they could be regarded as contributing to capital formation in the State road systems. Indeed, even the parts of such grants intended for maintenance could be treated in a similar way, since substantial maintenance is often equivalent to capital improvement. This leads to problems in identifying flows, since the capital gains accrue to the States, not the Commonwealth. However, the BTE took the view that such expenditure is part of a continuing program (in practical if not legal terms), and should therefore be treated as a continuing but variable annual expenditure. The substantiation of this view can be seen by examining past Commonwealth investment programs of this nature. The result of this is that the full amount of grants to the States by the Commonwealth Government in 1974-75 is included as a fully-attributed cost in this study. Similar treatment is given to maintenance for roads under direct Commonwealth control (but excluding National Roads). However, capital charges for roads within the Federal Territories are treated in line with the procedures for valuing capital assets in Annex A. Other costs which the Commonwealth Government incurs, and which are fully-attributed to road transport are deficit-funding activities related to bus operation in the ACT and NT. Operational and administrative costs associated with the Commonwealth Government's roads policy activities are also fully attributed in this study. However, costs associated with ancillary road transport activities are excluded.

Costs incurred by State Governments are essentially parallel to those of the Commonwealth Government. Similar methods and philosophies are used for attributing such costs. Essentially, the categories covered are grants, deficit funding and administrative costs. Again, costs of ancillary transport operations are excluded from the analysis. Local Government infrastructure activities (in the 'other' sector) are also attributed on a similar basis, with the addition of elements of private activities in relation to specific urban road developments.

Because the 'operations' subsector spans a wide range of activities, it is difficult to give brief general details of approaches to attribution. In the main, all operating costs relating to road transport services provided by commercial or quasi-commercial organisations are fully attributed in this study. Administrative costs associated with non-roads activities are excluded wherever possible. It should be noted that costs incurred in private motor vehicle operations (other than those for hire-and-reward) are excluded from this study on the basis of the special treatment outlined earlier. This is done despite the fact that some of those costs do, in fact, appear as revenues to the Commonwealth and State Governments.

Methods used in determining capital costs for those parts of road transport analysed in this study are treated in Annex A. As a final point in discussing attribution of costs in road transport, it should be mentioned that the substantial costs incurred in police, ambulance and hospital operations are excluded. There are several reasons for this, foremost amongst them being the fact that these services are operated on a broad social basis, despite their heavy use through road transport. On the same basis, the study excludes fines collected for general traffic offences (although some more specific revenues from fines are included, as mentioned earlier).

Allocation - Revenues

Since revenues to all sectors undertaking cost recovery in road transport are gathered from a wide variety of sources, considerable difficulty was experienced in allocating them between particular areas and classes of operation. Of necessity, this Report can only include brief details of these processes, since some of them involve complex analysis. The general philosophy adopted in performing these allocations was to use readily-available and accurate statistical measures where precise details of allocation were not known.

For the Commonwealth Government, one very important source of revenue is excise on fuel sales. Excise collections are split between areas and classes of operation on the basis of the task figures given in Table 6.1, coupled with energy consumption data compiled by Clark[1]. Company tax revenues are allocated on the basis of the types of operations from which such taxes were collected. All registration fees are first allocated on the basis of relative numbers of registrations in urban and rural areas[2], and are further allocated to classes of operation on the basis of vehicle type. In the cases of the ACT and NT (the only areas for which such functions are under Commonwealth control), this procedure effectively leads to all registration fees being allocated to urban operations, since fees collected from rural areas were negligible in the case of the Commonwealth. This same procedure (but on an Australia-wide basis) is used to allocate Commonwealth sales tax revenues. Licence fees are allocated to urban and rural areas on a straight relative population basis, with further subdivision into passenger and freight classes of operation on the basis of relative vehicle registrations.

Attributed Commonwealth Government revenues from land sales and rates are allocated between urban and rural areas on the basis of rateable land values, with further subdivision between passenger and freight transport on the basis of vehicle registrations. All revenues from parking charges are allocated to urban passenger transport. Any interest repayments are allocated on the basis of the nature of the organisations making such payments. This procedure would also apply to dividends accruing to the Commonwealth Government, if such dividends had been produced.

Essentially the same methods as those described above are used to allocate corresponding State Government revenues. However, some additional (or different) revenue items are involved. Grants from the Commonwealth Government are usually for specific purposes, and it is therefore relatively easy to allocate them between urban and rural areas. However, further allocation between

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(1) Nicholas Clark and Associates, Transport and Energy in Australia Part 2 - Consumption by Categories, BTE Occasional Paper 4, 1975.

(2) ABS, Motor Vehicle Registrations, (various quarters).

passenger and freight operations is based on relative capital charges (which are described later). Stamp duties and surcharges on insurance are allocated in the same way as registration fees. All road maintenance contributions are allocated to freight, with the urban/rural allocation on the basis of the nature and operations of the organisations paying such taxes. The same types of procedures are used to allocate Local Government revenues for analysis of the 'infrastructure' subsector of the 'other' sector.

Different problems are encountered in analysing the 'operations' subsector, and different allocation procedures are correspondingly necessary. In general, urban and rural bus operations were reported separately in financial statements. Indeed, in most cases separate organisations were involved. Therefore, revenues to such operations are allocated on the basis of published data, except where such data were not available. In such cases, allocation is based on estimated tasks, with different costing structures applied to urban and rural operations. Any grants received by bus services were generally for specific purposes, and could be directly identified through the stated purposes.

Revenues from freight operations are considerably more complex to allocate. In general, fairly substantial information on total freight revenues was available. However, virtually no published information on the division of such revenues between urban and rural areas was available. The BTE therefore developed a mechanism for allocating such revenues between urban and rural areas on the basis of the tasks and the types of vehicles involved in these tasks. Although this process could only be regarded as approximate, it is partly verified by very limited factual data available to the BTE. The validity of the process is further strengthened by the fact that its application results in both urban and rural freight operations returning profits, at least under usual commercial procedures for valuing capital and determining capital charges.

Allocation - Costs

Road transport activities are frequently cited as prime examples of joint cost/product situations. One characteristic of roads is that they are used by an immense variety of vehicles. All roads carry both freight and passenger traffic. Urban roads carry freight traffic which more correctly falls into the non-urban or rural category, while rural roads carry freight destined for urban areas. This situation is complex enough in itself but it is made even more so in Australia by the number of different organisations at all levels which are responsible for funding, constructing and maintaining roads. Accordingly, the question of allocating costs between various areas and classes of operation has several dimensions which are not found in other modes. Therefore, the methods developed for allocating costs (and particularly infrastructure costs) are described in the following paragraphs. Since these methods apply equally to the three sectors primarily involved in providing roads infrastructure, these problems are discussed in general terms before their application to specific sectors is described.

Capital charges are determined on the basis given in Annex A. The first stage is to develop such charges as totals for all roads in Australia. These charges are then allocated to various sectors on the basis of relative road lengths and types. Road lengths and types are ascribed to particular sectors on the basis of BTE assumptions regarding each sector's appropriate responsibilities for specific roads. This allocation process is quite arbitrary, since there is no consistent demarcation of responsibilities for funding, construction and maintenance of roads[(1)]. Specifically, identification of the appropriate demarcation of 'control'[(2)] of certain types of roads between State Government roads authorities and Local Government authorities involves

(1) Indeed, the systems of road classification vary significantly from State to State.

(2) 'Control', in this context, is still rather limited. In some instances, State Authorities will only provide help in funding Local Government road works for which specific approval is given.

some arbitrary assumptions. Generally, control of a road by a certain authority was taken as meaning that the particular authority had major responsiblity for funding capital works on that road, as well as being primarily responsible for its maintenance. This initial allocation of capital charges between sectors represents a slight variation on the methods adopted for the other modes. However, this variation proved necessary since no other information was available to allow roads to be treated on a basis comparable to that used for other modes.

A second feature of the allocation process adopted by the BTE for dealing with road infrastructure costs is also best treated in a general fashion. This feature relates to the processes developed for allocating costs between classes of operation (that is, passenger and freight). This problem is essentially one of a joint cost/product nature, as mentioned earlier. To develop a suitable approach to this problem, the BTE had to make certain assumptions. Foremost amongst these was the assumption that freight vehicles are usually heavy, and that passenger vehicles are usually light.[1]

There has been a good deal of research on the topic of road costs incurred as a result of particular types of traffic. The BTE was fortunate that the National Association of Australian State Road Authorities (NAASRA) had recently completed a detailed study[2] of the merits of changing vehicle weight restrictions and other limitations. This study, inter alia, examined the questions outlined above in great detail, and provided very useful broad

(1) Obviously, this is not strictly correct. Some passenger vehicles (buses, for example) are quite heavy, while some commercial vehicles (utilities) are relatively light. However, this assumption was judged to be sufficiently valid for the purposes for which it was intended.

(2) NAASRA, A Study of the Economics of Road Vehicle Limits, (various papers), Melbourne, 1976.

indications for the BTE's work. Some of the work by Jennings[1] was also valuable in developing methods for allocation of road infrastructure costs in this study. Basically, two separate measures were required:

- An appropriate measure for assessing the cost responsibility of various vehicle classes in regard to capital costs of road infrastructure;

- A parallel measure for determining cost responsibility for road maintenance.

In this study, capital charges are allocated on the basis of formulae developed by Jennings, but with constants and so on determined in line with Australian conditions by reference to the comprehensive NAASRA work. Under this approach, typical traffic composition for particular roads is examined with the aim of determining specific cost responsibilities. The approach is too detailed to describe in this Report, but the essential results[2] are as follows:

- For urban roads, 39 per cent of capital costs are allocated to freight traffic;

- For rural roads, 40 per cent of capital costs are allocated to freight traffic;

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(1) Jennings, A., Infrastructure Pricing and the EEC Common Transport Policy - The Case of Roads and Commercial Vehicles, Journal of Transport Economics and Policy, May 1976.

(2) It should be noted that the allocation to freight traffic is far higher than these values for those costs which can be directly attributed to use. However, road maintenance (for example) is needed as a result of many factors (including weather). Traffic wear is only one such factor. Non-traffic costs are allocated on the basis of PCU's (which are essentially passenger car equivalents (or units)). The figures given in the text could be regarded as the proportions of 'avoidable' costs of road freight in the categories concerned. Even so, the figures given are much higher than the proportions of freight traffic on the roads.

- For urban roads, 25 per cent of pavement maintenance costs are allocated to freight traffic;

- For rural roads, 40 per cent of pavement maintenance costs are allocated to freight traffic.

As in the case of the other modes, a cautionary note on the application of these allocation procedures is warranted. The BTE considers that the figures presented give a reasonable estimate of the costs of road construction and maintenance which are incurred as a result of the presence of particular classes of traffic. The BTE also regards such estimates as appropriate for use in a cost recovery study. However, their valid application does not go much further than this. In particular, pricing policies based directly on these 'technical' cost relationships could (and almost certainly would) lead to substantial misallocation of resources.

Commonwealth Government costs for road transport activities are allocated in several ways. Capital charges for road infrastructure are allocated between areas of operation on the basis of relative road lengths and assumed replacement costs of the roads in those areas. Further allocation of these costs between freight and passenger transport is performed using the factors determined by the methods described earlier. For purposes of analysis, maintenance expenditures were divided into three categories in line with the procedures adopted for costing purposes by some road construction authorities. These categories are:

- Pavement maintenance;

- Road furniture (signs, guard rails etc) maintenance;

- Roadside maintenance (rest areas, mowing etc).

Maintenance costs for urban and rural roads could be distinguished from published reports. Pavement maintenance costs are allocated between freight and passenger transport according to the procedures described earlier. Road furniture and road reserve maintenance costs are allocated on the basis of the vehicle-kilometre tasks performed in the respective classes of operation. Administration costs are allocated on the basis of the lengths of roads in each area. Allocation of administration costs between freight and passenger transport is made according to the relative proportion of all other costs for these two separate operations. Grants could be readily identified as pertaining to urban or rural operations by the specified purpose of each grant. Road grants are allocated between freight and passenger transport according to the general procedures developed for allocating capital charges for roads. Commonwealth deficit funding for bus operations is straightforward, as it only applies to urban operations.

State Government costs in road transport are essentially similar to those of the Commonwealth Government. Consequently, the allocation methods used are basically the same as those adopted for the Commonwealth Government sector. Again, contributions and grants made by the State Governments to Local Government and other agencies are specific in intent, and thus no problems arise in allocation.

For the 'Other' sector, two subsectors are distinguished as detailed earlier. The subsector relating to infrastructure is basically similar to the Commonwealth and State Government sectors and analogous allocation methods are used. For the 'operations' subsector, capital charges are allocated between the urban and non-urban areas on the basis of the number and (where known) the types of vehicles operating in those areas. The split between freight (hire-and-reward) operators and passenger operations is made according to the recorded numbers of buses and to commercial vehicles operating in the two areas.

Bus operating costs for urban and rural operations were obtained from figures published by the Bus Proprietors Association[1]. For freight operations, synthesised unit cost figures developed by Clark are used to apportion freight carriers' operating costs between rural and urban operations. Administrative costs are allocated in the same proportions as operating costs.

Data Sources

Most of the sources of information used in determining methods suitable for carrying out the study of road transport have already been noted in this Chapter. However, the actual financial information required for the study itself was obtained from many sources. Foremost among these were the annual reports of various State roads authorities, which generally gave comprehensive details of their undertakings. Annual reports of relevant Commonwealth and State departments were also used to obtain details of higher-level funding, regulatory and legislative arrangements. In certain cases, additional data were obtained from various reports published by State Auditors-General. Sources within the Commonwealth Department of Transport were also tapped to provide detailed information in certain cases.

For analysis of the 'operations' subsector, annual reports and other financial statements of various operating authorities were used as data sources. In particular, annual reports of government-operated bus and tram agencies were used to provide information on the quasi-commercial activities of such agencies. Freight carriers' costs and revenues were assessed in detail by reference to the annual reports of Mayne Nickless Pty Ltd and Thomas Nationwide Transport Pty Ltd.,

Further procedural information on studies of this type was obtained by reference to work by Haritos[2].

(1) BPA Bulletin, April 1977.
(2) Haritos, F., Rational Road Planning Policies in Canada, Canadian Transport Commission (Vols 1 to 4), May 1972.

RESULTS AND CONCLUSIONS - ROAD TRANSPORT

In drawing together the results of this study of cost recovery in road transport, estimates of revenues and costs are derived using the methods described in the earlier parts of this Chapter. These estimates are presented in Tables 6.3, 6.4, 6.5 and 6.6. Table 6.3 gives detailed revenues and costs for urban road passenger transport, while Table 6.4 gives the corresponding figures for urban road freight transport. Table 6.5 gives details of revenues and costs for rural road passenger transport, and corresponding rural road freight figures are given in Table 6.6. Each table shows revenues and costs for the Commonwealth Government sector, the State Government sector and the infrastructure and operations subsectors within the 'other' sector (i.e. the sector covering road transport activities by local Governments and commercial or quasi-commercial operational agencies). The figures are presented in this way to allow for later identification of any transfer payments which might be involved in the analysis. Tables 6.3, 6.4, 6.5 and 6.6 are each divided into two parts for presentation purposes.

As in the case of the studies of air and sea transport, the nature of these tables of revenues and costs warrants some comment. The tables should not be regarded as equivalent to 'balance sheets', since they present actual revenues and costs. They do not include balancing revenue or cost items such as deficit funding for the various bus operating authorities. Since private operators are included in the study, the problem of dividends which would normally be paid to agencies or individuals external to the frame of reference adopted for this study is encountered. As mentioned in earlier Chapters, the BTE's approach is to regard such payments as extraneous to the study. However, even when this additional problem is obviated, there are some specifically related problems in the case of road transport. In the study year, all public road transport operational authorities operated at losses. In the normal 'balance-sheet' approach, revenue items (the nature of which would depend on the way in

TABLE 6.3 - ROAD TRANSPORT REVENUES AND COSTS - URBAN PASSENGER - 1974-75

Sources of Revenues & Costs	Commonwealth Government	State Government
REVENUES ($M)		
Fuel Excise	273.1	-
Sales Tax	244.8	-
Registration Fees	3.0	171.2
Stamp Duty	-	33.0
Insurance Surcharge	-	5.1
Maintenance Taxes	-	..
Licence Fees	0.6	28.4
Property Taxes/Rates	3.9	49.1
Land Sales	3.7	-
Tolls and Other Fees	-	4.8
Grants/Subsidies	-	80.6
Contributions/Loans	-	37.0
Dividends/Interest	-	2.7
Payroll Tax	-	2.6
Company Tax	2.4	-
Fares/Freight Charges	-	-
Rentals/Concessions	-	-
TOTAL REVENUES ($M)	531.5	414.5

	Commonwealth Government			State Government		
COSTS ($M)	HC[a]	IHC[b]	ICC[a]	HC[a]	IHC[b]	ICC[a]
Depreciation	0.4	0.8	-	8.6	41.2	-
Interest	5.4	9.2	..	110.9	273.2	2.2
Operating Costs[d]	-	-	-	-	-	-
Maintenance	8.5	8.5	8.5	32.2	32.2	32.2
Administration	3.6	3.6	3.6	17.5	17.5	17.5
Grants etc(e)	106.4	106.4	106.4	86.6	86.6	86.6
Company Tax	-	-	-	-	-	-
TOTAL COSTS ($M)	124.3	128.5	118.5	255.8	450.7	138.5

(a) Indicates the Historical Cost method of treating capital costs.

(b) Indicates the Indexed Historical Cost method of treating capital costs.

(c) Indicates the Incurred Capital Cost method of treating capital costs.

(d) Includes payroll tax payments and maintenance (for operating authorities).

(e) Grants include any deficit funding.

TABLE 6.3 - (CONT) ROAD TRANSPORT REVENUES AND COSTS - URBAN PASSENGER - 1974-75

Sources of Revenues & Costs	Other (Infrastructure)	Other (Operations)
REVENUES ($M)		
Fuel Excise	-	-
Sales Tax	-	-
Registration Fees	-	-
Stamp Duty	-	-
Insurance Surcharge	-	-
Maintenance Taxes	-	-
Licence Fees	-	-
Property Taxes/Rates	155.2	-
Land Sales	-	-
Tolls and Other Fees	5.9	-
Grants/Subsidies	17.3	28.4
Contributions/Loans	13.2	3.0
Dividends/Interest	2.0	-
Payroll Tax	-	-
Company Tax	-	-
Fares/Freight Charges	-	143.6
Rentals/Concessions	-	4.9
TOTAL REVENUES ($M)	193.6	179.9

COSTS ($M)	HC[(a)]	IHC[(b)]	ICC[(c)]	HC[(a)]	IHC[(b)]	ICC[(c)]
Depreciation	5.0	24.2	-	11.2	16.3	-
Interest	65.2	109.4	6.9	6.4	9.8	3.7
Operating Costs[(d)]	-	-	-	186.1	186.1	186.1
Maintenance	49.9	49.9	49.9	-	-	-
Administration	18.9	18.9	18.9	17.4	17.4	17.4
Grants etc(e)	8.9	8.9	8.9	-	-	-
Company Tax	-	-	-	2.4	2.4	2.4
TOTAL COSTS ($M)	147.9	211.3	84.6	223.5	232.0	209.6

(a) Indicates the Historical Cost method of treating capital costs.
(b) Indicates the Indexed Historical Cost method of treating capital costs.
(c) Indicates the Incurred Capital Cost method of treating capital costs.
(d) Includes payroll tax payments and maintenance (for operating authorities).
(e) Grants include any deficit funding.

TABLE 6.4 - ROAD TRANSPORT REVENUE AND COSTS - URBAN FREIGHT - 1974-75

Sources of Revenues & Costs	Commonwealth Government			State Government		
REVENUES ($M)						
Fuel Excise	82.8			-		
Sales Tax	23.2			-		
Registration Fees	0.3			15.7		
Stamp Duty	-			3.4		
Insurance Surcharge	-			1.0		
Maintenance Taxes	-			20.3		
Licence Fees	..			2.1		
Property Taxes/Rates	2.9			2.1		
Land Sales	0.3			-		
Tolls and Other Fees	-			0.5		
Grants/Subsidies	-			60.4		
Contributions/Loans	-			6.2		
Dividends/Interest	-			-		
Payroll Tax	-			12.6		
Company Tax	49.6			-		
Fares/Freight Charges	-			-		
Rentals/Concessions	-			-		
TOTAL REVENUES ($M)	159.1			124.3		
COSTS ($M)	HC(a)	IHC(b)	ICC(c)	HC(a)	IHC(b)	ICC(c)
Depreciation	0.3	0.5	-	5.5	27.3	-
Interest	3.6	5.6	..	73.4	180.8	1.4
Operating Costs(d)	-	-	-	-	-	-
Maintenance	2.5	2.5	2.5	9.1	9.1	9.1
Administration	2.2	2.2	2.2	11.8	11.8	11.8
Grants etc(e)	60.3	60.3	60.3	11.1	11.1	11.1
Company Tax	-	-	-	-	-	-
TOTAL COSTS ($M)	68.9	71.1	65.0	110.9	240.1	33.4

(a) Indicates the Historical Cost method of treating capital costs.
(b) Indicates the Indexed Historical Cost method of treating capital costs.
(c) Indicates the Incurred Capital Cost method of treating capital costs.
(d) Includes payroll tax payments and maintenance (for operating authorities).
(e) Grants include any deficit funding.

TABLE 6.4 - (CONT) ROAD TRANSPORT REVENUES AND COSTS - URBAN FREIGHT - 1974-75

Sources of Revenues & Costs	Other (Infrastructure)			Other (Operations)		
REVENUES ($M)						
Fuel Excise		-			-	
Sales Tax		-			-	
Registration Fees		-			-	
Stamp Duty		-			-	
Insurance Surcharge		-			-	
Maintenance Taxes		-			-	
Licence Fees		-			-	
Property Taxes/Rates		15.3			-	
Land Sales		-			-	
Tolls and Other Fees		0.7			-	
Grants/Subsidies		6.8			-	
Contributions/Loans		5.9			-	
Dividends/Interest		0.7			-	
Payroll Tax		-			-	
Company Tax		-			-	
Fares/Freight Charges		-			1257.2	
Rentals/Concessions		-			..	
TOTAL REVENUES ($M)		29.4			1257.2	
COSTS ($M)	HC(a)	IHC(b)	ICC(c)	HC(a)	IHC(b)	ICC(c)
Depreciation	3.2	16.0	-	157.2	230.9	-
Interest	43.2	76.3	2.0	100.4	158.6	83.2
Operating Costs(d)	-	-	-	840.0	840.0	840.0
Maintenance	13.1	13.1	13.1	-	-	-
Administration	12.7	12.7	12.7	210.0	210.0	210.0
Grants etc(e)	6.1	6.1	6.1	-	-	-
Company Tax	-	-	-	49.6	49.6	49.6
TOTAL COSTS ($M)	78.3	124.2	33.9	1357.2	1489.1	1182.8

(a) Indicates the Historical Cost method of treating capital costs.
(b) Indicates the Indexed Historical Cost method of treating capital costs.
(c) Indicates the Incurred Capital Cost method of treating capital costs.
(d) Includes payroll tax payments and maintenance (for operating authorities).
(e) Grants include any deficit funding.

TABLE 6.5 - ROAD TRANSPORT REVENUES AND COSTS - RURAL PASSENGER - 1974-75

Sources of Revenues & Costs	Commonwealth Government			State Government		
REVENUES ($M)						
Fuel Excise	217.1			-		
Sales Tax	114.8			-		
Registration Fees	0.2			79.8		
Stamp Duty	-			15.1		
Insurance Surcharge	-			2.0		
Maintenance Taxes	-			..		
Licence Fees	0.1			10.9		
Property Taxes/Rates	0.2			21.8		
Land Sales	-			-		
Tolls and Other Fees	-			..		
Grants/Subsidies	-			144.6		
Contributions/Loans	-			16.8		
Dividends/Interest	-			0.1		
Payroll Tax	-			0.4		
Company Tax	1.6			-		
Fares/Freight Charges	-			-		
Rentals/Concessions	-			-		
TOTAL REVENUES ($M)	334.0			291.5		
COSTS ($M)	HC (a)	IHC (b)	ICC (c)	HC (a)	IHC (b)	ICC (c)
Depreciation	0.8	3.0	-	16.5	60.3	-
Interest	8.1	19.7	..	163.4	366.5	3.3
Operating Costs (d)	-	-	-	-	-	-
Maintenance	8.6	8.6	8.6	49.0	49.0	49.0
Administration (e)	0.5	0.5	0.5	18.5	18.5	18.5
Grants etc	144.0	144.0	144.0	38.7	38.7	38.7
Company Tax	-	-	-	-	-	-
TOTAL COSTS ($M)	162.0	175.8	153.1	286.1	533.0	109.5

(a) Indicates the Historical Cost method of treating capital costs.
(b) Indicates the Indexed Historical Cost method of treating capital costs.
(c) Indicates the Incurred Capital Cost method of treating capital costs.
(d) Includes payroll tax payments and maintenance (for operating authorities).
(e) Grants include any deficit funding.

TABLE 6.5 - (CONT) ROAD TRANSPORT REVENUES AND COSTS - RURAL PASSENGER - 1974-75

Sources of Revenues & Costs	Other (Infrastructure)			Other (Operations)		
REVENUES ($M)						
Fuel Excise		-			-	
Sales Tax		-			-	
Registration Fees		-			-	
Stamp Duty		-			-	
Insurance Surcharge		-			-	
Maintenance Taxes		-			-	
Licence Fees		-			-	
Property Taxes/Rates		69.7			-	
Land Sales		-			-	
Tolls and Other Fees		2.9			-	
Grants/Subsidies		24.2			..	
Contributions/Loans		15.5			..	
Dividends/Interest		1.9			..	
Payroll Tax		-			-	
Company Tax		-			-	
Fares/Freight Charges		-			18.3	
Rentals/Concessions		-			..	
TOTAL REVENUES ($M)		114.2			18.3	
COSTS ($M)	HC(a)	IHC(b)	ICC(c)	HC(a)	IHC(b)	ICC(c)
Depreciation	9.7	35.4	-	3.0	4.4	-
Interest	96.0	160.4	5.8	0.9	1.5	0.3
Operating Costs(d)	-	-	-	12.8	12.8	12.8
Maintenance	39.9	39.9	39.9	-	-	-
Administration	19.1	19.1	19.1	1.2	1.2	1.2
Grants etc(e)	16.6	16.6	16.6	-	-	-
Company Tax	-	-	-	1.6	1.6	1.6
TOTAL COSTS ($M)	181.3	271.4	81.4	19.5	21.5	15.9

(a) Indicates the Historical Cost method of treating capital costs.
(b) Indicates the Indexed Historical Cost method of treating capital costs.
(c) Indicates the Incurred Capital Cost method of treating capital costs.
(d) Includes payroll tax payments and maintenance (for operating authorities).
(e) Grants include any deficit funding.

TABLE 6.6 - ROAD TRANSPORT REVENUES AND COSTS - RURAL FREIGHT - 1974-75

Sources of Revenues & Costs	Commonwealth Government	State Government
REVENUES ($M)		
Fuel Excise	106.8	-
Sales Tax	25.1	-
Registration Fees	..	18.1
Stamp Duty	-	3.0
Insurance Surcharge	-	1.0
Maintenance Taxes	-	39.4
Licence Fees	..	2.1
Property Taxes/Rates	..	4.9
Land Sales	-	-
Tolls and Other Fees	-	-
Grants/Subsidies	-	90.4
Contributions/Loans	-	8.4
Dividends/Interest	-	-
Payroll Tax	-	8.1
Company Tax	-	-
Fares/Freight Charges	97.2	-
Rentals/Concessions	-	-
TOTAL REVENUES ($M)	229.1	175.4

	Commonwealth Government			State Government		
COSTS ($M)	HC[(a)]	IHC[(b)]	ICC[(c)]	HC[(a)]	IHC[(b)]	ICC[(c)]
Depreciation	0.5	1.9	-	10.4	38.7	-
Interest	4.9	12.7	..	104.7	257.9	2.1
Operating Costs[(d)]	-	-	-			
Maintenance	5.4	5.4	5.4	29.4	29.4	29.4
Administration	0.3	0.3	0.3	11.7	11.7	11.7
Grants etc(e)	90.0	90.0	90.0	37.3	37.3	37.3
Company Tax	-	-	-	-	-	-
TOTAL COSTS ($M)	101.1	110.3	95.7	193.5	375.0	80.5

(a) Indicates the Historical Cost method of treating capital costs.
(b) Indicates the Indexed Historical Cost method of treating capital costs.
(c) Indicates the Incurred Capital Cost method of treating capital costs.
(d) Includes payroll tax payments and maintenance (for operating authorities).
(e) Grants include any deficit funding.

TABLE 6.6 - (CONT) ROAD TRANSPORT REVENUES AND COSTS - RURAL FREIGHT - 1974-75

Sources of Revenues & Costs	Other (Infrastructure)			Other (Operations)		
REVENUES ($M)						
Fuel Excise	-			-		
Sales Tax	-			-		
Registration Fees	-			-		
Stamp Duty	-			-		
Insurance Surcharge	-			-		
Maintenance Taxes	-			-		
Licence Fees	-			-		
Property Taxes/Rates	16.1			-		
Land Sales	-			-		
Tolls and Other Fees	0.8			-		
Grants/Subsidies	20.3			-		
Contributions/Loans	18.1			-		
Dividends/Interest	0.3			-		
Payroll Tax	-			-		
Company Tax	-			-		
Fares/Freight Charges	-			780.0		
Rentals/Concessions	-			..		
TOTAL REVENUES ($M)	55.6			780.0		
COSTS ($M)	HC(a)	IHC(b)	ICC(c)	HC(a)	IHC(b)	ICC(c)
Depreciation	6.1	22.7	-	55.9	82.1	-
Interest	65.2	151.4	3.4	33.8	53.4	28.0
Operating Costs(d)	-	-	-	409.5	409.5	409.5
Maintenance	17.3	17.3	17.3	-	-	-
Administration	12.0	12.0	12.0	100.0	100.0	100.0
Grants etc(e)	8.3	8.3	8.3	-	-	-
Company Tax	-	-	-	97.2	97.2	97.2
TOTAL COSTS ($M)	108.9	211.7	41.0	696.4	742.2	634.7

(a) Indicates the Historical Cost method of treating capital costs.
(b) Indicates the Indexed Historical Cost method of treating capital costs.
(c) Indicates the Incurred Capital Cost method of treating capital costs.
(d) Includes payroll tax payments and maintenance (for operating authorities).
(e) Grants include any deficit funding.

which the deficit was funded in each case) would be entered to ensure that a balance was struck in the appropriate financial statement. However, these balancing items are inappropriate to this study, since they would lead to an artificial implications of 100 per cent cost recovery for the public road transport operational authorities. Therefore, the balancing revenue terms involved in deficit funding in such cases have been omitted in Tables 6.3 to 6.6. Nonetheless, the fact remains that all these authorities drew on the resources of their respective governments (including Local Governments) to fund their deficits. Therefore, the amounts to which deficit funding was undertaken by the Commonwealth, State and Local Governments are included as legitimate costs to these governments, even though equivalent revenues to the relevant bus or tram authorities are not included in the statements of their costs and revenues. Conversely, if there had been different circumstances in which Governments received dividends from their related road transport operational authorities, the amounts of such dividends would not have been treated as costs to the authorities involved, but would have been included as legitimate revenues to the respective governments. This is same practice as that adopted in the cases of government-owned operating authorities and their financial relationships to their respective governments in air and sea transport (e.g. TAA, QANTAS and ANL).

Interest and capital repayments by particular agencies are included as legitimate costs to those agencies. However, payments of this nature to Commonwealth, State or Local Governments are only included as revenues to a government if the particular government is the actual source of the loan involved. This is the same as the approach adopted for other modes, and is not, in fact, a major problem with road transport. Of course, the destination of interest repayments by private road transport operators are treated as extraneous to the study.

One factor which complicates this presentation of revenues and costs is the special treatment which was developed for private motor vehicle operations. This treatment has already been described in detail earlier in this Chapter, and this description need not be repeated here. The net result is that all levels of government receive revenues from private motor vehicle operators (through such mechanisms as excise, sales tax, registration fees and so on). However, the BTE's action in defining such operators themselves as being outside the framework of the study means that such revenues are not uniquely identified. This does not affect the results of the study if the view is taken that such operators are users of a service, with the 'service' defined as provision of roads infrastructure but not of road transport per se.

Three different sets of values for costs are presented in Tables 6.3 to 6.6. These three sets of costs relate to the three different methods of treating capital costs (as described in Annex A). The values for depreciation and interest items presented in Tables 6.3 to 6.6 are also actually derived in Annex A. The other cost elements (operating costs, administration costs, company tax and payroll tax) do not, of course, vary with the method chosen to value capital assets. The term 'administration' is used to differentiate between government administrative costs and the more usual definition of 'operating costs'. It is worth noting at this stage that payroll tax is included explicitly as a revenue item in the road transport analysis as a direct result of the inclusion of a 'State Government' sector. However, actual costs incurred by organisations paying such tax are included in operating costs.

Private road transport in general has not been examined in relation to the 'other' sector, except for private scheduled bus and freight operations. However, the implications of private road transport operations for the Commonwealth, State and Local Governments (through company and payroll taxes, for example) are included as mentioned earlier. The notional problems which forced the BTE to omit general private road transport operations have been described previously.

After revenues and costs had been fully determined in line with the procedures detailed above, they were applied to the 'practical' framework outlined earlier and shown in Figure 6.2 (which differs from the formal framework in Figure 6.1 only in terminology and in the splitting of the 'other' sector). Table 6.7 shows details of cost recovery by the Commonwealth Government in terms of that framework. Again, three sets of cost recovery figures are presented to reflect the three different methods of treating capital costs. Cost recovery figures on the same basis for State Governments are given in Table 6.8, while corresponding figures for the 'other' sector are given in Tables 6.9 and 6.10. The first of these latter tables gives details for the 'infrastructure' subsector, while Table 6.10 gives corresponding details for the 'operations' subsector. In the case of the 'operations' subsector, those activities which are included have been mentioned earlier.

The final process in this stage of the analysis of road transport was to draw together the various sector results to obtain an overall view of road transport cost recovery. This process is complicated by the fact that there are three separate sectors analysed in the study of road transport (with one of these further divided into two subsectors), and this leads to a complex system of financial arrangements. A certain amount of difficulty was therefore encountered in determining the levels of transfer payments between the three sectors. However, the appropriate levels of transfer payments were finally identified, and overall revenues were calculated by adding revenues for all sectors and subtracting the appropriate transfer payments. Overall costs were determined in the same way. The results of this analysis are shown in Table 6.11.

Some constraints on the use of the types of results given in Table 6.11 have already been outlined in earlier Chapters. However, there is an added dimension to these constraints in the case of road transport. It must be very clearly understood that the results in Table 6.11 can only be regarded as indicating the extent to which users pay for road transport in a very special

TABLE 6.7 - ROAD TRANSPORT COST RECOVERY SUMMARY - PRACTICAL FRAMEWORK[(a)] - COMMONWEALTH GOVERNMENT - 1974-75

Area of Operation	Class of Operation	Item	Values HC[(b)]	IHC[(c)]	ICC[(d)]
URBAN	Passenger	Revenues ($M)	531.5	531.5	531.5
		Costs ($M)	124.3	128.5	118.5
		Balance ($M)	407.2	403.0	413.0
		Cost Recovery	428%	414%	449%
URBAN	Freight	Revenues ($M)	159.1	159.1	159.1
		Costs ($M)	68.9	71.1	65.0
		Balance ($M)	90.2	88.0	94.1
		Cost Recovery	231%	224%	245%
RURAL	Passenger	Revenues ($M)	334.0	334.0	334.0
		Costs ($M)	162.0	175.8	153.1
		Balance ($M)	172.0	158.2	180.9
		Cost Recovery	206%	190%	218%
RURAL	Freight	Revenues ($M)	229.1	229.1	229.1
		Costs ($M)	101.1	110.3	95.7
		Balance ($M)	128.0	118.8	133.4
		Cost Recovery	227%	208%	239%
URBAN	Passenger and Freight Combined	Revenues ($M)	690.6	690.6	690.6
		Costs ($M)	193.2	199.6	183.5
		Balance ($M)	497.4	491.0	507.1
		Cost Recovery	357%	346%	376%
RURAL	Passenger and Freight Combined	Revenues ($M)	563.1	563.1	563.1
		Costs ($M)	163.1	286.1	248.8
		Balance ($M)	400.0	277.0	314.3
		Cost Recovery	345%	197%	226%
TOTAL	Passenger and Freight Combined	Revenues ($M)	1253.7	1253.7	1253.7
		Costs ($M)	356.3	485.7	432.3
		Balance ($M)	897.4	768.0	821.4
		Cost Recovery	352%	258%	290%

(a) Indicates the institutional and organisational system of reporting shown in Figure 6.2.
(b) Indicates the Historical Cost method of treating capital costs.
(c) Indicates the Indexed Historical Cost method of treating capital costs.
(d) Indicates the Incurred Capital Cost method of treating capital costs.

TABLE 6.8 - ROAD TRANSPORT COST RECOVERY SUMMARY - PRACTICAL FRAMEWORK[(a)] - STATE GOVERNMENT - 1974-75

Area of Operation	Class of Operation	Item	Values HC[(b)]	IHC[(c)]	ICC[(d)]
URBAN	Passenger	Revenues ($M)	414.5	414.5	414.5
		Costs ($M)	255.8	450.7	138.5
		Balance ($M)	158.7	-36.2	276.0
		Cost Recovery	162%	92%	299%
URBAN	Freight	Revenues ($M)	124.3	124.3	124.3
		Costs ($M)	110.9	240.1	33.4
		Balance ($M)	13.4	-115.8	90.9
		Cost Recovery	112%	52%	372%
RURAL	Passenger	Revenues ($M)	291.5	291.5	291.5
		Costs ($M)	286.1	533.0	109.5
		Balance ($M)	5.4	-241.5	182.0
		Cost Recovery	102%	55%	266%
RURAL	Freight	Revenues ($M)	175.4	175.4	175.4
		Costs ($M)	193.5	375.0	80.5
		Balance ($M)	-18.1	-199.6	94.9
		Cost Recovery	91%	47%	218%
URBAN	Passenger and Freight Combined	Revenues ($M)	538.8	538.8	538.8
		Costs ($M)	366.7	690.8	171.9
		Balance ($M)	172.1	-152.0	366.9
		Cost Recovery	147%	78%	313%
RURAL	Passenger and Freight Combined	Revenues ($M)	466.9	466.9	466.9
		Costs ($M)	560.2	1065.8	252.4
		Balance ($M)	-93.3	-598.9	214.5
		Cost Recovery	83%	44%	185%
TOTAL	Passenger and Freight Combined	Revenues ($M)	1005.7	1005.7	1005.7
		Costs ($M)	926.9	1756.6	424.3
		Balance ($M)	78.8	-750.9	581.4
		Cost Recovery	109%	57%	237%

(a) Indicates the institutional and organisational system of reporting shown in Figure 6.2.
(b) Indicates the Historical Cost method of treating capital costs.
(c) Indicates the Indexed Historical Cost method of treating capital costs.
(d) Indicates the Incurred Capital Cost method of treating capital costs.

TABLE 6.9 - ROAD TRANSPORT COST RECOVERY SUMMARY - PRACTICAL FRAMEWORK[a] - OTHER (INFRASTRUCTURE) - 1974-75

Area of Operation	Class of Operation	Item	Values HC[b]	IHC[c]	ICC[d]
URBAN	Passenger	Revenues($M)	193.6	193.6	193.6
		Costs($M)	147.9	211.3	84.6
		Balance($M)	45.7	-17.7	109.0
		Cost Recovery	131%	92%	229%
URBAN	Freight	Revenues($M)	29.4	29.4	29.4
		Costs($M)	78.3	124.2	33.9
		Balance($M)	-48.9	-94.8	-4.5
		Cost Recovery	38%	24%	87%
RURAL	Passenger	Revenues($M)	114.2	114.2	114.2
		Costs($M)	181.3	271.4	81.4
		Balance($M)	-67.1	-157.2	32.8
		Cost Recovery	63%	42%	140%
RURAL	Freight	Revenues($M)	55.6	55.6	55.6
		Costs($M)	108.9	211.7	41.0
		Balance($M)	-53.3	-156.1	14.6
		Cost Recovery	51%	26%	136%
URBAN	Passenger and Freight Combined	Revenues($M)	223.0	223.0	223.0
		Costs($M)	226.2	335.5	118.5
		Balance($M)	-3.2	-112.5	104.5
		Cost Recovery	99%	66%	188%
RURAL	Passenger and Freight Combined	Revenues($M)	169.8	169.8	169.8
		Costs($M)	290.2	547.2	159.5
		Balance($M)	-120.4	-377.4	10.3
		Cost Recovery	59%	31%	106%
TOTAL	Passenger and Freight Combined	Revenues($M)	392.8	392.8	392.8
		Costs($M)	516.4	882.7	278.0
		Balance($M)	-123.6	-489.9	114.8
		Cost Recovery	76%	44%	141%

(a) Indicates the institutional and organisational system of reporting shown in Figure 6.2.
(b) Indicates the Historical Cost method of treating capital costs.
(c) Indicates the Indexed Historical Cost method of treating capital costs.
(d) Indicates the Incurred Capital Cost method of treating capital costs.

TABLE 6.10 - ROAD TRANSPORT COST RECOVERY SUMMARY - PRACTICAL FRAMEWORK [a] - OTHER (OPERATIONS) - 1974-75

Area of Operation	Class of Operation	Item	Values HC [b]	IHC [c]	ICC [d]
URBAN	Passenger	Revenues ($M)	179.9	179.9	179.9
		Costs ($M)	233.5	232.0	209.6
		Balance ($M)	-43.6	-52.1	-29.7
		Cost Recovery	80%	78%	86%
URBAN	Freight	Revenues ($M)	1257.2	1257.2	1257.2
		Costs ($M)	1357.2	1489.1	1182.8
		Balance ($M)	-100.0	-231.9	74.4
		Cost Recovery	93%	84%	106%
RURAL	Passenger	Revenues ($M)	18.3	18.3	18.3
		Costs ($M)	19.5	21.5	15.9
		Balance ($M)	-1.2	-3.2	2.4
		Cost Recovery	94%	85%	115%
RURAL	Freight	Revenues ($M)	780.0	780.0	780.0
		Costs ($M)	696.4	742.2	634.7
		Balance ($M)	83.6	37.8	145.3
		Cost Recovery	112%	105%	123%
URBAN	Passenger and Freight Combined	Revenues ($M)	1437.1	1437.1	1437.1
		Costs ($M)	1580.7	1721.1	1392.4
		Balance ($M)	-143.6	-284.0	44.7
		Cost Recovery	91%	83%	103%
RURAL	Passenger and Freight Combined	Revenues ($M)	798.3	798.3	798.3
		Costs ($M)	715.9	763.7	650.6
		Balance ($M)	82.4	34.6	147.7
		Cost Recovery	112%	105%	123%
TOTAL	Passenger and Freight Combined	Revenues ($M)	2235.4	2234.5	2234.5
		Costs ($M)	2296.6	2484.8	2043.0
		Balance ($M)	-61.2	-249.4	192.4
		Cost Recovery	97%	90%	109%

(a) Indicates the institutional and organisational system of reporting shown in Figure 6.2.
(b) Indicates the Historical Cost method of treating capital costs.
(c) Indicates the Indexed Historical Cost method of treating capital costs.
(d) Indicates the Incurred Capital Cost method of treating capital costs.

TABLE 6.11 - ROAD TRANSPORT COST RECOVERY SUMMARY - PRACTICAL FRAMEWORK[(a)] - OVERALL - 1974-75

Area of Operation	Class of Operation	Item	Values HC[(b)]	IHC[(c)]	ICC[(d)]
URBAN	Passenger	Revenues ($M)	1159.0	1159.0	1159.0
		Costs ($M)	536.0	807.6	336.3
		Balance ($M)	622.4	351.4	822.7
		Cost Recovery	216%	144%	345%
URBAN	Freight	Revenues ($M)	1320.7	1320.7	1320.7
		Costs ($M)	1364.7	1673.9	1064.5
		Balance ($M)	-44.0	-353.2	256.2
		Cost Recovery	97%	79%	124%
RURAL	Passenger	Revenues ($M)	550.2	550.2	550.2
		Costs ($M)	441.1	793.9	152.1
		Balance ($M)	109.1	-243.7	398.1
		Cost Recovery	125%	69%	362%
RURAL	Freight	Revenues ($M)	848.0	848.0	848.0
		Costs ($M)	725.9	1065.2	447.9
		Balance ($M)	122.1	-217.2	370.1
		Cost Recovery	117%	80%	177%
URBAN	Passenger and Freight Combined	Revenues ($M)	2479.7	2479.7	2479.7
		Costs ($M)	1901.3	2481.5	1400.8
		Balance ($M)	578.4	-1.8	1078.9
		Cost Recovery	130%	100%	177%
RURAL	Passenger and Freight Combined	Revenues ($M)	1398.2	1398.2	1398.2
		Costs ($M)	1167.0	1859.1	630.0
		Balance ($M)	231.2	-460.9	768.2
		Cost Recovery	120%	75%	222%
TOTAL	Passenger and Freight Combined	Revenues ($M)	3877.9	3877.9	3877.9
		Costs ($M)	2068.3	4340.6	2030.8
		Balance ($M)	809.6	-462.7	1847.1
		Cost Recovery	126%	89%	191%

(a) Indicates the institutional and organisational system of reporting shown in Figure 6.2.
(b) Indicates the Historical Cost method of treating capital costs.
(c) Indicates the Indexed Historical Cost method of treating capital costs.
(d) Indicates the Incurred Capital Cost method of treating capital costs.

sense. That sense could be taken as being cost recovery from users who use the road transport infrastructure (private motorists, etc) or those who use commercial or quasi-commercial road transport services (bus passengers, cargo forwarders and so on). In particular, costs which private motor vehicle owners incur as a result of their ownership of motor vehicles are omitted from the equations.

As in the statements of cost recovery by individual sectors (Tables 6.7 to 6.10), the results in Table 6.11 contain three sets of figures reflecting the different methods of treating capital costs. The overall results given in Table 6.11 could be regarded as an estimate of the extent to which end users of road transport services meet the costs of providing such services, within the constraints outlined above. However, the general limitations detailed in Chapter 4 for the corresponding air transport figures should be noted in regard to these road transport results as well.

It is not possible to draw many specific conclusions from the figures given in Tables 6.7 to 6.11. In line with results in other modes, different methods of treating capital costs generally have a substantial influence on apparent levels of cost recovery. The BTE's preferences for the indexed historical cost (IHC) method as the best measure of resource use, and the incurred capital cost (ICC) method as the best measure of short-term financial viability, have already been indicated in regard to the results of the studies of other modes. The same preferences apply to road transport.

It is not uncommon for road transport to be at the centre of contoversies about services for which no direct charges are made. In fact, the results of this study indicate that road transport is operating under de facto cost recovery guidelines which lead to very high financial recovery rates in some cases. Irrespective of arguments about the validity of attributing excise and other taxes to road transport, the results of this study were developed on the same basis as that used for other modes. In that sense, the results are at least comparable in some ways. In financial terms, road transport spans a range of cost recovery levels, with the net result perhaps best classified as 'typical to high'. However, it must be recognised that these results are distorted by the unavoidable special treatment given to private road transport operations. Also, the BTE does not wish to imply that these results pre-empt in any way a substantial study of road pricing. It has been asserted several times that the BTE actually holds the opposite view.

CHAPTER 7 - COST RECOVERY IN RAIL TRANSPORT, 1974-75

RAIL TRANSPORT STRUCTURE AND TASKS

As in the case of the other modes of transport, there are several distinct groups of operations which can be regarded as comprising rail transport in Australia. Since the distinctions between these groups are central to the way in which the study of rail transport was conducted, it is useful to consider them in some detail.

The Commonwealth Government has three avenues of involvement in rail transport. These avenues can be classified in the following broad terms:

- Administration of the States Grants (Urban Public Transport) Act 1974, and other legislation under which funds are provided for rail transport;
- Policy activities of the Commonwealth Department of Transport;
- Operations of the Australian National Railways Commission (formerly the Commonwealth Railways Commission).

Under the States Grants (Urban Public Transport) Act 1974, grants are made on the basis of two-thirds Commonwealth Government funding for approved capital improvements to urban public transport systems. A substantial proportion of the funds expended under this Act have been assigned to rail transport projects, but other projects (bus, tram, etc) have also been included. Some specific projects for which grants were made were discussed in Chapter 2 of this Report. In the broader policy sense, the Commonwealth Department of Transport is involved in a wide range of activities related to rail transport.

During 1974-75, these activities included work leading up to establishment of the Australian National Railways Commission to replace the Commonwealth Railways Commission, initiation of transfer of State railway systems to the Commonwealth Government, and establishment of a pool of freight wagons for inter-system use. There was also, of course, a variety of administrative activity related to funding of various non-urban rail transport improvements or modifications. Prior to the end of 1974-75, the Commonwealth Government (through the then Commonwealth Railways Commission as distinct from the Department of Transport) provided, operated and maintained rail facilities as Commonwealth Railways (operating as COMRAIL). On 1 July 1975, with the establishment of the Australian National Railways Commission (operating as ANR, or Australian National Railways), this task was expanded to include all Tasmanian rail systems. Subsequently, the non-metropolitan part of the South Australian rail system was transferred to the Commonwealth Government, and was incorporated in the Australian National Railways. This substantially increased the Commonwealth involvement in rail transport, and would be reflected in cost recovery analyses for years following 1974-75.

State Government railways systems are organised in a broadly similar fashion to those of the Commonwealth Government. State Transport Departments (or their equivalents) are primarily concerned with basic policy matters, including the development of co-ordinated transport policies for all modes. They are also involved in administration of subsidies, grants and other financial aspects of the interaction between State Governments and their associated rail transport systems. In terms of structure, such Departments are generally operated with relatively small staffs and on low budgets. On the other hand, the States in general have large long-established public-enterprise organisations to operate, develop and administer the State rail systems. Since the study year adopted for this analysis, the Tasmanian rail organisation and part of its South Australian counterpart have been taken over by the Commonwealth Government, as noted above. However, this study analyses the situation prior to that change. Both types of State Government activity in rail transport (that is, the policy/co-ordination and operational aspects) have been analysed for this study.

In addition to government railways, large private mining companies and various other private-enterprise operations (dominated by those in north-western and northern Australia) have substantial ancillary rail freight operations. These operations represent a large proportion (about 50 per cent) of the freight movements by rail in Australia, and the distances over which freight is moved are typical by railway standards. Therefore, these operations are quite substantial. However, the specialised nature of such operations and the fact that such operations are heavily intertwined with those of the parent companies led to their exclusion from the study.

A summary of the overall rail transport task for 1974-75 is given by the figures presented in Table 7.1. Rail transport provides urban, intrastate and interstate services for both passengers and freight. In this study, interstate services were included with intrastate rail operations as non-urban domestic services.

TABLE 7.1 - RAIL TRANSPORT STATISTICS[a] 1974-75

Item	Urban	Non-Urban	Total
Passenger movements (millions)	357.5	16.7	374.2
Passenger-km (millions)	4,573.0	2,702.8	7,275.8
Passenger-tonne-km (millions)	319.9	191.7	511.6
Freight movements (millions of net tonnes)	-[b]	104.0	104.0
Freight tonne-km ('000 millions)	-[b]	31.0	31.0

(a) Source: Published annual reports of various government rail authorities. Excludes movements by private rail systems (see text).
(b) Urban rail freight does not play a significant role, and has been regarded as insignificant in this study.

The overall rail transport passenger task is clearly generally dominated by suburban services. However, this is not the case for Commonwealth Railways, for which passenger services are essentially non-urban. Freight services are defined for the purposes of this study as comprising parcels, mails, goods and livestock. In essence, rail transport has an important role in movement of large numbers of passengers in urban areas, and in freight movements elsewhere. In particular, rail transport operates effectively in movement of bulk goods over longer distances, but is losing favour for carriage of diverse goods over shorter distances. This is a function of the technical and institutional characteristics of rail systems, and is yet another example of contraction in the historical role of a transport mode in the light of changing technical, social and economic circumstances.

ORGANISATION OF THE STUDY OF RAIL TRANSPORT

As a first step in determining a suitable framework for analysing cost recovery in rail transport, the detailed task definition system derived in Chapter 1 was applied to this mode. Clearly, some of the divisions of tasks envisaged in Chapter 1 are irrelevant in the case of rail transport. The most obvious of these is the 'international' area of operation, which simply does not exist for rail transport! Similarly, urban freight operations are carried out by rail, but at such a low level that they could be regarded as negligible. These constraints, when applied to the general system of task definition in Chapter 1, lead to a formal structure for the study of cost recovery in rail transport along the lines of that shown in Figure 7.1.

In fact, the formal structure shown in Figure 7.1 is actually quite well aligned with the way in which rail transport is organised on an institutional basis in Australia. Therefore, the relevant categories in Figure 7.1 are shown as the organisational structure for the study of rail transport in Table 7.2. From that table, it can be seen that a full set of sectors ('Commonwealth Government', 'State Government', and 'Other') is included in the study. Each of these sectors is analysed in terms of its cost recovery from passenger and freight operations separately (except for urban freight, which is excluded from the study). For the sake of completeness, the 'practical' framework for the study is

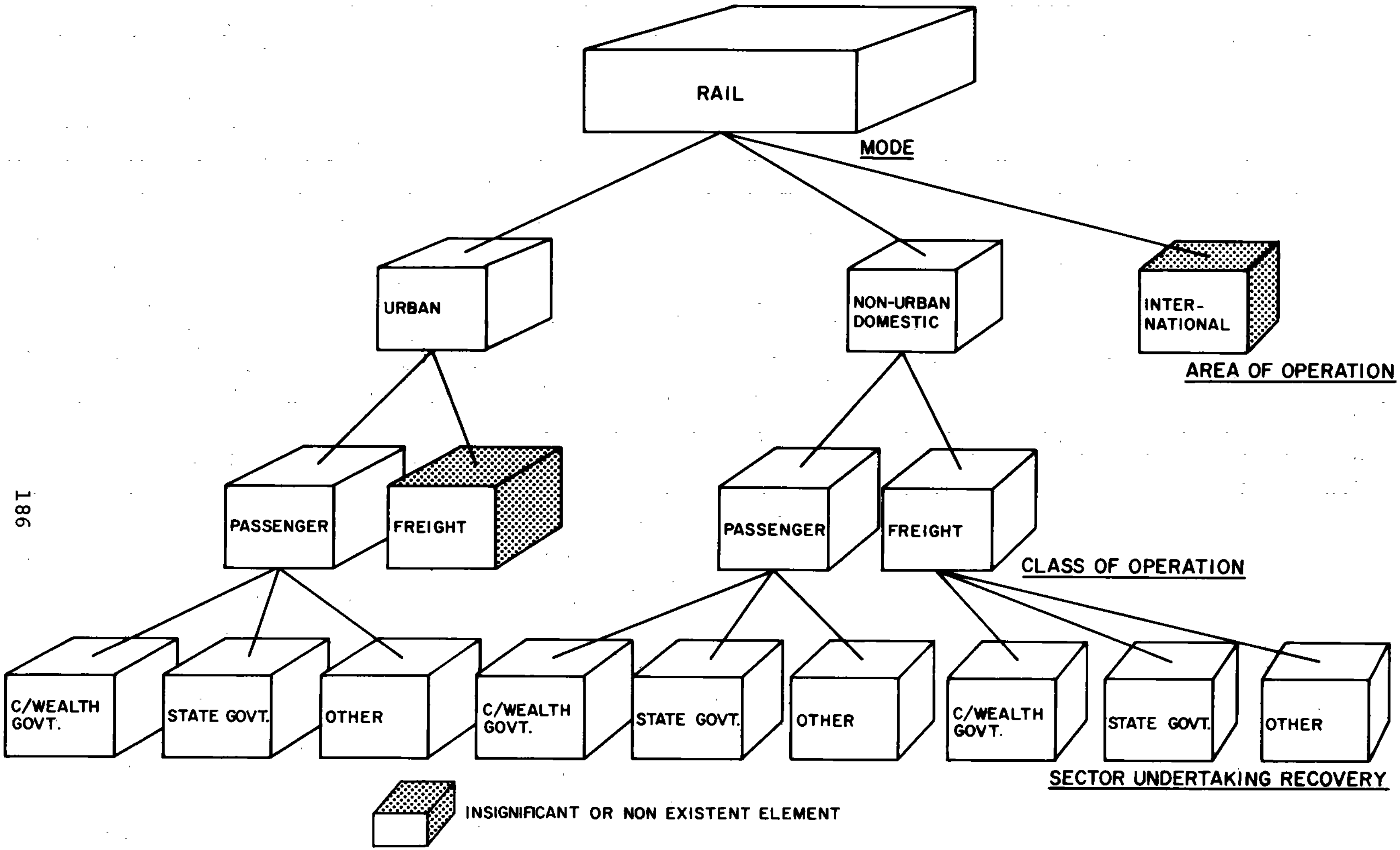

FIGURE 7·1
FORMAL STRUCTURE FOR REPORTING COST RECOVERY FIGURES IN RAIL TRANSPORT

included as Figure 7.2, as in the case of the other modes. However, this particular diagram is essentially only a simplification of Figure 7.1, since the formal and practical frameworks are identical in the case of rail transport.

The main point which should be noted in respect to Figure 7.2 is that the private railways are excluded for the reasons discussed earlier. However, another less obvious point is that all government railways are included in the 'other' sector. In fact, railways operate under a variety of organisational and financial relationships to their parent governments. Such relationships have developed historically, and have particularly reflected the important role railways have played in urban, rural and industrial development. On the other hand, some aspects of railway operations have at least a stated aim of operating on a quasi-commercial basis. On balance, the BTE decided that it was appropriate to consider government railways in the same way as TAA, QANTAS and ANL - that is, effectively as commercial organisations. The Commonwealth Government role is therefore confined (for the purposes of this study) to these activities regarding the policy and associated financial aspects of rail transport. State government roles cover the corresponding activities as they relate to particular State rail system operations.

In summary, the analysis covers cost recovery by three sectors operating within the rail transport field. The first sector ('Commonwealth Government') encompasses most of the Commonwealth Department of Transport's activities within rail transport. These include policy development and administration of various items of legislation under which grants are made to State governments for rail transport purposes. They also include financial transfers between the Commonwealth Government and ANR (formerly COMRAIL) for purposes of deficit funding. However, the Commonwealth Government sector does not include revenue collections by other Commonwealth Government agencies (such as the Treasury), since private railways have been excluded from the study, and other rail authorities included in the analysis do not pay taxes and charges

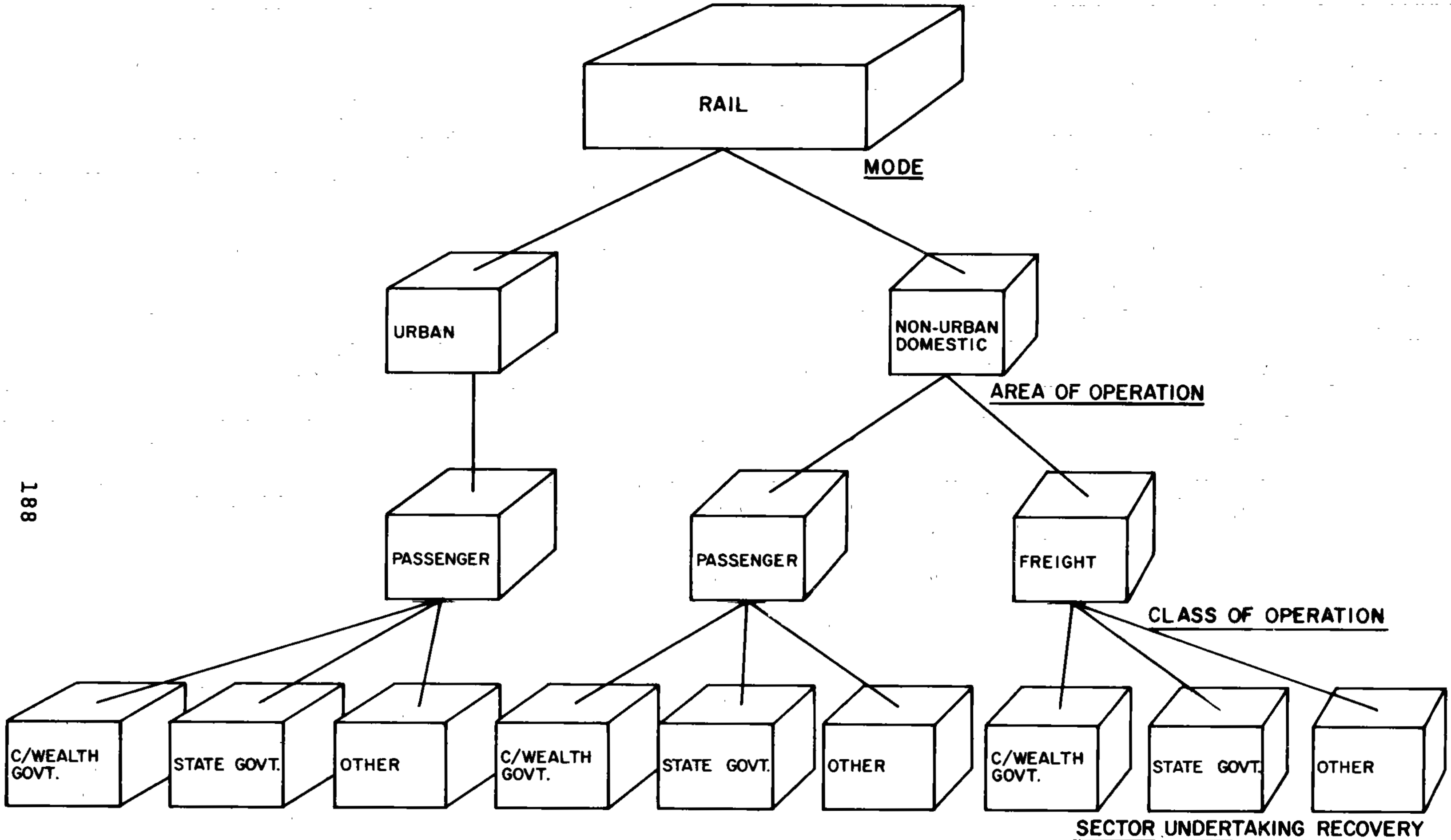

FIGURE 7·2
PRACTICAL FRAMEWORK FOR ANALYSING COST RECOVERY IN RAIL TRANSPORT

which would be collected by such agencies. The second sector ('State Government') is limited to those activities which involve transfer of funds between State Governments and associated rail systems.

TABLE 7.2 - ORGANISATIONAL STRUCTURE FOR RAIL TRANSPORT

Attribute	Classification	Notes and Comments
MODE	Rail	
AREA OF OPERATION	Urban	
	Non-urban Domestic	
CLASS OF OPERATION	Passenger	Analysed for all areas of operation.
	Freight [(a)]	As the urban rail freight task was regarded as insignificant, all freight was allocated to non-urban operations.
SECTOR UNDERTAKING RECOVERY	Commonwealth Government	Provides subsidies and grants, meets deficits on operations.
	State Government	Provides subsidies and grants, meets deficits on operations.
	Other [(a)]	Public enterprises.

(a) Excludes operations by private railways (see text).

The third sector ('Other') includes actual rail operations by Commonwealth and State government railway systems, but excludes the operations of private railway systems.

METHODS ADOPTED IN THE STUDY OF RAIL TRANSPORT

Attribution - Revenues

Due to the relatively straightforward nature of rail transport financial activities, it was not as difficult to attribute revenues to particular sectors undertaking cost recovery within rail transport as it was in other modes. For the purposes of this study of cost recovery, the only revenues which are attributed to the Commonwealth Government are the relatively low amounts involved in repayment of loans by COMRAIL (later to become ANR) and other railway systems. Of course, if COMRAIL had returned a profit in the study year, this amount would also be attributed as revenue to the Commonwealth Government. However, this was not the case.

The situation with State Governments is rather more complex. The following items were attributed as revenues to State Governments:

- Interest and repayments on loans made to rail operating authorities;
- Payroll tax collected from the same source[(1)];
- Dividends from operations of rail authorities (which did not, in fact, return such dividends in the year under consideration);
- Grants made by the Commonwealth Government under the States Grants (Urban Public Transport) Act 1974 and other legislation;

Railway operating authorities collect revenue from a wide range of sources. Only income derived from operations not directly associated with rail transport is excluded from this study. Typical of this type of exclusion are returns from real-estate and other non-transport investments. Some of the revenue items included in the 'Other' sector are as follows:

- Grants from State Governments (and indirectly from the Commonwealth Government);
- Fares, freight charges and associated revenues;
- Revenues from rentals, concessions and advertising;
- Operating subsidies.

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(1) Because of the exclusion of private railways from the study, payroll tax from such railways is also excluded.

Attribution - Costs

The major area of costs for the Commonwealth Government in its administrative and policy role in rail transport is in grants to the States for improvements to railway systems. The manner in which such grants should be attributed and processed is a matter of some contention. On the one hand, such grants are mainly intended for capital works purposes, and hence could be regarded as contributions to capital formation in the rail systems. This view would lead to a complex problem in identification, since the capital assets accrue to the rail systems, and not to the Commonwealth Government per se. The BTE took the alternative view that such expenditure by the Commonwealth Government is a once-and-for-all cost, since the Commonwealth is not responsible for maintenance of such assets. This view is reinforced by the fact that such grants are usually practically (if not legally) parts of continuing programs of expenditure. The net result of this is that the full amount of grants by the Commonwealth Government in 1974-75 is included as a fully-attributed cost in this study. This is the same rationale as that adopted for the treatment of road transport. Other Commonwealth Government costs which were attributed to rail transport included deficit funding for COMRAIL and operational and administrative costs associated with the Department of Transport's policy activities.

Costs for State Governments are essentially broken down in the same way as for the Commonwealth Government (that is, as grants, deficit funding and administrative costs). The rationale for attribution is the same as that adopted above for the Commonwealth Government.

For the railway systems themselves, all operating costs relating to rail transport activities are fully attributed in this study. Administrative costs associated with non-rail activities (as mentioned above) were assessed as being negligible, and are not specifically excluded from the study.

Methods used in determining capital costs for rail transport are treated in detail in Annex A.

Allocation - Revenues

In general, revenues are allocated to particular areas and classes of operation on the same bases as those used to allocate costs, which are treated in later paragraphs of this Report. Therefore, the following comments on allocation of revenues refer to some cost relativities which have not yet been established.

As mentioned above, the Commonwealth Government (in terms of the definition in this Report) receives only very limited revenues from rail transport. These are allocated between areas and classes of operation on the basis of the general capital charges in such areas and classes. This is clearly an inexact basis for allocation, but the small sums involved mean that any errors would be small as well. This basis was also reinforced by the exact details of loans to which such repayments were related, where such details were known.

The situation with revenues to the State Governments is rather more complex. Grants from the Commonwealth Government are treated as revenues to the State Governments in this study. However, such grants are usually for specific purposes, and it was possible to allocate them to areas of operation on the basis of the specific intent of each grant. Further subdivision of these revenues into classes of operation (passenger or freight) is on the basis of detailed consideration of costs associated with such classes for particular systems. Interest and repayments on loans are allocated on the basis of the relative magnitudes of capital charges in each area and class of operation. The magnitudes of these charges are established in later paragraphs. Payroll tax revenues are allocated on the basis of relative operating costs for particular areas and classes of operation. This variation is regarded as more suitable for allocation of costs which relate directly to wages and salaries.

For the railway systems, explicit information on revenues from fares and freight charges is usually available. Therefore, the fundamental allocation of these revenue items by class of operation is not difficult. In this study, all urban rail freight is ignored, so that basic freight revenues can be allocated without further analysis. However, not all systems provide information on the division of revenues between urban and non-urban operations. Where such a distribution was available, it is used in preparing the results of this study. In the absence of such information, passenger revenues are allocated on the basis of tasks performed in the relevant areas of operation (as measured on a passenger-km basis).

Grants, operating subsidies and similar payments are allocated on the basis of the intent of such revenues. If intent is not clear, then arbitrary allocation measures along the lines mentioned earlier are used. Miscellaneous revenues (those from concessions, rentals, catering and so on) are almost universally derived from sources related to passenger transport, and are therefore allocated entirely to passenger operations. Where there is doubt about allocation of such revenues between areas of operation, the same approach as that used for allocating fares is adopted (that is, allocation based on the relative tasks measured in passenger-km).

Clearly, these methods of allocating revenues are arbitrary to some extent. This is a result of a lack of sufficiently-detailed financial statements on the activities of rail systems. Where the BTE had to make arbitrary allocations, maximum possible care was taken to ensure that the system chosen was one for which there was a strong rational and intuitive basis.

Allocation - Costs

Commonwealth Government costs for rail transport activities are allocated in a variety of ways. All Commonwealth Department of Transport costs associated with administration of the States Grants (Urban Public Transport) Act 1974, are allocated to urban passenger services. The rail component of such costs is based on the relative proportion of grants for rail transport projects. Allocation of grants themselves is based on specific intent, where it was known, or on the basis of capital charges if a further allocation was necessary. Deficit funding for COMRAIL is allocated to non-urban services, with further allocation based on estimates of the relative deficits incurred in passenger and freight services.

State Government costs in rail transport, in terms of this study, are essentially similar to those of the Commonwealth Government. In view of this, the same methods were adopted to allocate costs between areas and classes of operations. In addition, several State Governments made specific subsidies available to railway systems, and these are allocated on the basis of stated intent. If specific intent was not clear, allocation is based on appropriate task figures. Those specific subsidies for which intent is not known tend to be relatively small, so that this arbitrary allocation should not cause any major distortion of results.

By far the most complex problem associated with the study of rail transport was allocation of costs incurred by the railway systems to areas and classes of operation. In the absence of detailed financial information, the BTE was forced to develop its own allocation procedures, based on various readily-measurable parameters. In the BTE's view, such procedures are suitable for this particular task, despite their arbitrary nature. They are intended to give reasonable estimates of the costs of providing particular services. However, the BTE repeats its strong proviso (already stated for the other modes, regardless of the source of the allocation procedures) that such allocation procedures are in no way a suitable basis for pricing. They are merely intended to allocate costs to services, and appropriate pricing for such services must be regarded as a quite separate question.

The level of information provided by railway authorities in their published reports varies significantly. The BTE's approach was to use the more detailed information in its original form, and to use other information to derive appropriate allocation 'rules-of-thumb'. Therefore, the actual allocations of rail transport costs in this Report reflect verified and accurate detailed costs, as well as the results of synthesised allocation procedures. It is inappropriate to give full details of this whole procedure, since it is clearly quite complex and involves a good deal of detailed analysis. However, Table 7.3 gives broad details of the methods used to allocate operating costs, where inadequate alternative data were available. The BTE believes that the system of allocation shown in Table 7.3 gives reasonable approximation to costs in particular areas and classes of operation. Nevertheless, it is freely admitted that the results <u>are</u> approximations, and should not be used outside the confines of this study. Railway operation has always been regarded as an extremely complex joint cost/product problem, and the BTE would not like to suggest that the allocation procedures used here are anything but an initial approach to solution of that problem.

Capital costs incurred by the railway systems are allocated on the basis of tasks measured in train-km. This is regarded as an acceptably appropriate measure of capital renewal requirements, especially for rolling-stock. Other measures are available, but the train-km system appears to best fit observed technical characteristics. As in the case of State Government revenues, payroll tax is allocated on the basis of other operating costs.

Data Sources

The data required by the BTE for this study related mainly to 1974-75. Heavy reliance was placed on the published annual reports of Commonwealth and State rail authorities. In most instances, these were the only major sources of data available to the BTE. Additional data were obtained from the various

TABLE 7.3 - METHODS OF ALLOCATION OF OPERATING COSTS

Operating Cost	Basis of Allocation[a]
MAINTENANCE OF WAY AND WORKS	
. Administration and general	Train-km task
. Maintenance and renewals	Tonne-km task
. Fences, gates, etc,	Track-km to allocate between urban and non-urban; train-km task within non-urban
. Slips and flood repairs	All non-urban, allocated by tonne-km task
. Weighbridges, scales, lifting cranes, etc.	All freight
. Stock yards	All freight
. Road motors - domestic service	All non-urban passenger
. Balance	According to relative allocations determined from the above maintenance costs
ROLLING STOCK	
<u>Maintenance</u>	
. Locomotives	
- Steam	All freight
- Diesel electric	Allocated by train-km task to areas and classes
- Electric	All urban passenger[b]
- Other	All freight
. Goods stock	All freight
. Electric coaching stock	All urban passenger
. Rail motors	All non-urban passenger
. Other coaching stock	All non-urban passenger
<u>Motive Power</u>	
. Rail motor operation	All non-urban passenger
. Electric motormen	All urban passenger
. Balance	All non-urban freight
<u>Examination and Lubrication of Vehicles</u>	
. Electric service	All urban passenger
. Other	All non-urban, allocated by tonne-km task

TABLE 7.3 - (CONT) METHODS OF ALLOCATION OF OPERATING COSTS

Operating Cost	Basis of Allocation[a]
Balance of rolling stock costs	According to relative allocations determined from the above rolling stock costs
ELECTRICAL ENGINEERING	All urban passenger
MISCELLANEOUS OPERATIONS	All passenger; allocated by tonne-km task
OTHER	According to relative allocations determined from all the above costs

(a) These methods are only used in default of factual allocations.
(b) It is recognised that this situation is changing with increased electrification and use of electric locomotives for goods trains.

published State Auditor-General's reports, and from sources within the Commonwealth Department of Transport.

Figures for the year under examination were not available for the Transport Commission of Tasmania. Consequently, in that instance, revenues and costs were estimated from past trends. In certain cases, data available within the BTE from previous specific rail studies were also of value.

It is worth noting that the institutional arrangements within rail transport in Australia changed after the end of the study year. Creation of ANR led to changes in both names and groupings of particular authorities, and this would be reflected in future cost recovery studies. This change does not alter the basic formulation of the study, but it does render some of the data surveys irrelevant for future studies.

RESULTS AND CONCLUSIONS - RAIL TRANSPORT

Estimates of revenues and costs for rail transport were derived using the methods described in the earlier parts of this Chapter. These estimates are presented in Tables 7.4, 7.5 and 7.6. Table 7.4 gives detailed revenues and costs for urban passenger rail transport, while Table 7.5 gives the corresponding figures for non-urban rail passenger transport. Table 7.6 gives details of revenues and costs for non-urban rail freight. Each table shows revenues and costs for the Commonwealth Government sector, the State Government sector and the 'other' sector (i.e. the sector covering operations by public rail authorities). The figures are presented in this way to simplify identification of transfer payments and so on. Tables 7.4, 7.5 and 7.6 are all divided into two parts for presentation purposes.

As in the case of the other modes of transport, the nature of these tables of revenues and costs warrants some comment. The tables cannot be regarded as equivalent to 'balance sheets', since they give actual revenues and costs, and do not include

TABLE 7.4 - RAIL TRANSPORT REVENUES AND COSTS - DOMESTIC URBAN OPERATIONS - PASSENGER - 1974-75

Sources of Revenues & Costs	Commonwealth Government			State Government		
REVENUES ($M)						
Fares/Freight Charges	-			-		
Grants/Subsidies	-			16.9		
Payroll Tax	-			12.7		
Commercial Rentals & Concessions	-			-		
Dividends/Interest	0.8			27.7		
TOTAL REVENUES ($M)	0.8			57.3		
COSTS ($M)	HC[(a)]	IHC[(b)]	ICC[(c)]	HC[(a)]	IHC[(b)]	ICC[(c)]
Depreciation	-	-	-	-	-	-
Interest	-	-	-	-	-	-
Operating Costs	0.5	0.5	0.5	-	-	-
Grants/ Subsidies[(d)]	17.9	17.9	17.9	119.9	119.9	119.9
TOTAL COSTS ($M)	18.4	18.4	18.4	119.9	119.9	119.9

(a) Indicates the Historical Cost method of treating capital costs.
(b) Indicates the Indexed Historical Cost method of treating capital costs.
(c) Indicates the Incurred Capital Cost method of treating capital costs.
(d) Grants include any deficit funding.

TABLE 7.4 - (CONT) RAIL TRANSPORT REVENUES AND COSTS - DOMESTIC URBAN OPERATIONS - PASSENGER - 1974-75

Sources of Revenues & Costs	Other		
REVENUES ($M)			
Fares/Freight Charges	82.7		
Grants/Subsidies	16.9		
Payroll Tax	-		
Commercial Rentals & Concessions	37.7		
Dividends/Interest	-		
TOTAL REVENUES ($M)	137.3		
COSTS ($M)	HC (a)	IHC (b)	ICC (c)
Depreciation	7.2	17.2	-
Interest	46.0	86.1	43.5
Operating Costs (d)	224.7	224.7	224.7
Grants/Subsidies	-	-	-
TOTAL COSTS ($M)	277.9	328.0	268.2

(a) Indicates the Historical Cost method of treating capital costs.
(b) Indicates the Indexed Historical Cost method of treating capital costs.
(c) Indicates the Incurred Capital Cost method of treating capital costs..
(d) Includes any payroll taxes paid.

TABLE 7.5 - RAIL TRANSPORT REVENUES AND COSTS - DOMESTIC NON-URBAN OPERATIONS - PASSENGER - 1974-75

Sources of Revenues & Costs	Commonwealth Government			State Government		
REVENUES ($M)						
Fares/Freight Charges	-			-		
Grants/Subsidies	-			12.1		
Payroll Tax	-			8.2		
Concessions	-			-		
Dividends/Interest	0.7			16.5		
TOTAL REVENUES ($M)	0.7			36.8		
COSTS ($M)	HC[(a)]	IHC[(b)]	ICC[(c)]	HC[(a)]	IHC[(b)]	ICC[(c)]
Depreciation	-	-	-	-	-	-
Interest	-	-	-	-	-	-
Operating Costs	0.2	0.2	0.2	-	-	-
Grants/ Subsidies[(d)]	22.3	22.3	22.3	87.2	87.2	87.2
TOTAL COSTS ($M)	22.5	22.5	22.5	87.2	87.2	87.2

(a) Indicates the Historical Cost method of treating capital costs.
(b) Indicates the Indexed Historical Cost method of treating capital costs.
(c) Indicates the Incurred Capital Cost method of treating capital costs.
(d) Grants include any deficit funding.

TABLE 7.5 - (CONT) RAIL TRANSPORT REVENUES AND COSTS - DOMESTIC NON-URBAN OPERATIONS - PASSENGER - 1974-75

Sources of Revenues & Costs	Other		
REVENUES ($M)			
Fares/Freight Charges	53.8		
Grants/Subsidies	12.4		
Payroll Tax	-		
Concessions	25.2		
Dividends/Interest	-		
TOTAL REVENUES ($M)	91.4		
COSTS ($M)	HC [a]	IHC [b]	ICC [c]
Depreciation	5.1	11.7	-
Interest	31.3	58.8	26.3
Operating Costs [d]	117.4	117.4	117.4
Grants/Subsidies	-	-	-
TOTAL COSTS ($M)	153.8	187.9	143.7

(a) Indicates the Historical Cost method of treating capital costs.
(b) Indicates the Indexed Historical Cost method of treating capital costs.
(c) Indicates the Incurred Capital Cost method of treating capital costs.
(d) Includes any payroll taxes paid.

TABLE 7.6 - RAIL TRANSPORT REVENUES AND COSTS - DOMESTIC NON-URBAN OPERATIONS - FREIGHT - 1974-75

Sources of Revenues & Costs	Commonwealth Government			State Government		
REVENUES ($M)						
Fares/Freight Charges	-			-		
Grants/Subsidies	-			28.5		
Payroll Tax	-			19.5		
Concessions	-			-		
Dividends/Interest	1.3			38.9		
TOTAL REVENUES ($M)	1.3			86.9		
COSTS ($M)	HC[a]	IHC[b]	ICC[c]	HC[a]	IHC[b]	ICC[c]
Depreciation	-	-	-	-	-	-
Interest	-	-	-	-	-	-
Operating Costs	0.2	0.2	0.2	-	-	-
Grants/Subsidies[d]	33.3	33.3	33.3	254.5	254.5	254.5
TOTAL COSTS ($M)	33.5	33.5	33.5	254.5	254.5	254.5

(a) Indicates the Historical Cost method of treating capital costs.
(b) Indicates the Indexed Historical Cost method of treating capital costs.
(c) Indicates the Incurred Capital Cost method of treating capital costs.
(d) Grants include any deficit funding.

TABLE 7.6 - (CONT) RAIL TRANSPORT REVENUES AND COSTS - DOMESTIC NON-URBAN OPERATIONS - FREIGHT - 1974-75

Sources of Revenues & Costs	Other		
REVENUES ($M)			
Fares/Freight Charges	614.4		
Grants/Subsidies	29.0		
Payroll Tax	-		
Concessions	-		
Dividends/Interest	-		
TOTAL REVENUES ($M)	643.4		
COSTS ($M)	HC[a]	IHC[b]	ICC[c]
Depreciation	11.1	28.0	-
Interest	74.4	140.0	61.9
Operating Costs[d]	785.6	785.6	785.6
Grants/Subsidies	-	-	-
TOTAL COSTS ($M)	871.1	953.6	847.5

(a) Indicates the Historical Cost method of treating capital costs.
(b) Indicates the Indexed Historical Cost method of treating capital costs.
(c) Indicates the Incurred Capital Cost method of treating capital costs.
(d) Includes any payroll taxes paid.

balancing cost items such as deficit funding for the railway authorities. Since private railways are excluded, the problem of dividends which would normally be paid to agencies or individuals external to the frame of reference adopted for this study is not encountered. However, even without this additional problem, there are some specific related problems in the case of rail transport. In the study year, all public rail transport authorities operated at losses. In the normal 'balance-sheet' fashion, revenue items (the nature of which would depend on the way in which the deficit was funded in each case) would be entered to ensure that a balance was struck in the financial statement. However, these balancing items are inappropriate to this study, since they would lead to an implication of 100 percent cost recovery for the public rail authorities. Therefore, the balancing revenue terms involved in deficit funding in such cases have been omitted in Tables 7.4, 7.5 and 7.6. Nonetheless, the fact remains that all these authorities drew on the resources of their respective governments to fund their deficits. Therefore, the amounts to which deficit funding was undertaken by the Commonwealth Government and State Governments are included as legitimate costs to these governments, even though equivalent revenues to the relevant rail authorities are not included in the statements of their costs and revenues. Conversely, in different circumstances, there could have been cases in which State Governments received dividends from their related rail authorities. In such cases, the amounts of dividends would not have been treated as costs to the authorities involved, but would have been included as legitimate revenues to the respective State Governments. This is same practice as that adopted in the cases of government-owned operating authorities and their financial relationships to their respective governments in other modes (e.g. TAA, QANTAS and ANL).

Interest and capital repayments by particular agencies are included as legitimate costs to those agencies. However, payments of this nature to the Commonwealth or State Governments are only included as revenues to a government if the particular government is the actual source of the loan involved. This is the same as the approach adopted for other modes, but there is an important additional complicating factor in the case of rail transport. Because of historical capital expenditure through loans raised from overseas sources, some railways contribute to 'National Debt sinking funds'. These funds are reflections of past write-offs of capital debts, and are clearly a legitimate part of the rail authorities' financial responsibilities. In this study, payments by rail authorities to such sinking funds are implicitly included in capital costs for those authorities. In such cases, governments effectively only act in a sense as 'pools' for rationalising and consolidating overseas debts. Although this practice certainly involves a considerable financial advantage to authorities whose responsibilities have been written off in this way, it is impossible to estimate either the source or extent of such advantage. In regard to the sinking fund payments themselves, they could be considered as transfers <u>through</u> the relevant governments. Therefore, payments of this nature are not included as revenues to governments. Similarly, balancing cost items are not included in the two government sectors. As stated above, such payments are included as costs to the authorities which initially used the funds.

Three different sets of values for costs are presented in Tables 7.4, 7.5 and 7.6. These three sets of costs relate to the three different methods of treating capital costs (as described in Annex A). The values for depreciation and interest items presented in Tables 7.4, 7.5 and 7.6 are also actually described in Annex A. The other cost elements (operating costs, company tax and payroll tax) do not, of course, vary with the method chosen to value capital assets. It is worth noting at this stage that payroll tax is included explicitly in the rail transport analysis as a direct result of the inclusion of a 'State Government' sector.

Private rail transport has not been examined in relation to the 'other' sector. Also, the implications of private rail transport operations for the Commonwealth Government and State Governments (through company and payroll taxes, for example) are excluded. The data deficiencies and notional problems which forced the BTE to omit private rail transport operations have been described previously.

After revenues and costs had been fully determined in line with the procedures detailed above, they were applied to the 'practical' framework outlined earlier and shown in Figure 7.2 (which is effectively the same as the formal framework in Figure 7.1). Table 7.7 shows details of cost recovery by the Commonwealth Government in terms of that framework. Again, three sets of cost recovery figures are presented to reflect the three different methods of treating capital costs. Cost recovery figures on the same basis for State Governments are given in Table 7.8, while corresponding figures for the 'other' sector are given in Table 7.9. In the case of the 'other' sector, private rail transport activities are excluded for the reasons given earlier.

The final process in this stage of the analysis of rail transport was to draw together the various sector results to obtain an overall view of rail transport cost recovery. This process is complicated by the fact that there are three separate sectors analysed in the study of rail transport, and this leads to a rather complex intertwining of financial arrangements. A certain amount of difficulty was encountered in determining the levels of transfer payments between the three sectors. However, the appropriate levels of transfer payments were finally identified, and overall revenues were calculated by adding revenues for all sectors and subtracting the appropriate transfer payments. Overall costs were determined in the same way. The results of this analysis are shown in Table 7.10.

Absence of results for the operations of private rail transport leads to some distortions in the overall results given in Figure 7.10. In particular, the overall freight results and those for rail transport as a whole are affected by this omission. However, private rail systems do not normally compete with government

TABLE 7.7 - RAIL TRANSPORT COST RECOVERY SUMMARY - PRACTICAL FRAMEWORK[(a)] - COMMONWEALTH GOVERNMENT - 1974-75

Area of Operation	Class of Operation	Item	Values HC[(b)]	Values IHC[(c)]	Values ICC[(d)]
DOMESTIC URBAN OPERATIONS[(e)]	Passenger	Revenues ($M)	0.8	0.8	0.8
		Costs ($M)	18.4	18.4	18.4
		Balance ($M)	-17.6	-17.6	-17.6
		Cost Recovery	4%	4%	4%
DOMESTIC NON-URBAN OPERATIONS	Passenger	Revenues ($M)	0.7	0.7	0.7
		Costs ($M)	22.5	22.5	22.5
		Balance ($M)	-21.8	-21.8	-21.8
		Cost Recovery	3%	3%	3%
DOMESTIC NON-URBAN OPERATIONS	Freight	Revenues ($M)	1.3	1.3	1.3
		Costs ($M)	33.5	33.5	33.5
		Balance ($M)	-32.2	-32.2	-32.2
		Cost Recovery	4%	4%	4%
DOMESTIC NON-URBAN OPERATIONS	Passenger and Freight Combined	Revenues ($M)	2.0	2.0	2.0
		Costs ($M)	56.0	56.0	56.0
		Balance ($M)	-54.0	-54.0	-54.0
		Cost Recovery	4%	4%	4%
ALL DOMESTIC OPERATIONS	Passenger	Revenues ($M)	1.5	1.5	1.5
		Costs ($M)	40.9	40.9	40.9
		Balance ($M)	-39.4	-39.4	-39.4
		Cost Recovery	4%	4%	4%
ALL DOMESTIC OPERATIONS	Passenger and Freight Combined	Revenues ($M)	2.8	2.8	2.8
		Costs ($M)	74.4	74.4	74.4
		Balance ($M)	-71.6	-71.6	-71.6
		Cost Recovery	4%	4%	4%

(a) Indicates the institutional and organisational system of reporting shown in Figure 7.2. In the case of rail transport, this is effectively the same as the formal structure in Figure 7.1, with appropriate exclusions. Excludes private rail operations.

(b) Indicates the Historical Cost method of treating capital costs.

(c) Indicates the Indexed Historical Cost method of treating capital costs.

(d) Indicates the Incurred Capital Cost method of treating capital costs.

(e) Since urban rail freight is ignored in this study, there is no 'total' category for all urban operations.

TABLE 7.8 - RAIL TRANSPORT COST RECOVERY SUMMARY - PRACTICAL FRAMEWORK[a] - STATE GOVERNMENT - 1974-75

Area of peration	Class of Operation	Item	Values		
			HC[b]	IHC[c]	ICC[d]
DOMESTIC URBAN OPERATIONS[e]	Passenger	Revenues ($M)	57.3	57.3	57.3
		Costs ($M)	119.9	119.9	119.9
		Balance ($M)	-62.6	-62.6	-62.6
		Cost Recovery	48%	48%	48%
DOMESTIC NON-URBAN OPERATIONS	Passenger	Revenues ($M)	36.8	36.8	36.8
		Costs ($M)	87.2	87.2	87.2
		Balance ($M)	-50.4	-50.4	-50.4
		Cost Recovery	42%	42%	42%
DOMESTIC NON-URBAN OPERATIONS	Freight	Revenues ($M)	86.9	86.9	86.9
		Costs ($M)	254.5	254.5	254.5
		Balance ($M)	-167.6	-167.6	-167.6
		Cost Recovery	34%	34%	34%
DOMESTIC NON-URBAN OPERATIONS	Passenger and Freight Combined	Revenues ($M)	123.7	123.7	123.7
		Costs ($M)	341.7	341.7	341.7
		Balance ($M)	-218.0	-218.0	-218.0
		Cost Recovery	36%	36%	36%
ALL DOMESTIC OPERATIONS	Passenger	Revenues ($M)	94.1	94.1	94.1
		Costs ($M)	207.1	207.1	207.1
		Balance ($M)	-113.0	-113.0	-113.0
		Cost Recovery	45%	45%	45%
ALL DOMESTIC OPERATIONS	Passenger and Freight Combined	Revenues ($M)	181.0	181.0	181.0
		Costs ($M)	461.6	461.6	461.6
		Balance ($M)	-280.6	-280.6	-280.6
		Cost Recovery	39%	39%	39%

(a) Indicates the institutional and organisational system of reporting shown in Figure 7.2. In the case of rail transport, this is effectively the same as the formal structure in Figure 7.1, with appropriate exclusions. Excludes private rail operations.
(b) Indicates the Historical Cost method of treating capital costs.
(c) Indicates the Indexed Historical Cost method of treating capital costs.
(d) Indicates the Incurred Capital Cost method of treating capital costs.
(e) Since urban rail freight is ignored in this study, there is no 'total' category for all urban operations.

TABLE 7.9 - RAIL TRANSPORT COST RECOVERY SUMMARY - PRACTICAL FRAMEWORK[(a)] - OTHER - 1974-75

Area of Operation	Class of Operation	Item	Values HC[(b)]	IHC[(c)]	ICC[(d)]
DOMESTIC URBAN OPERATIONS[(e)]	Passenger	Revenues ($M)	137.3	137.3	137.3
		Costs ($M)	277.9	328.0	268.2
		Balance ($M)	-140.6	-190.7	-130.9
		Cost Recovery	49%	42%	51%
DOMESTIC NON-URBAN OPERATIONS	Passenger	Revenues ($M)	91.4	91.4	91.4
		Costs ($M)	153.8	187.9	143.7
		Balance ($M)	-62.4	-96.5	-52.3
		Cost Recovery	59%	49%	64%
DOMESTIC NON-URBAN OPERATIONS	Freight	Revenues ($M)	643.4	643.4	643.4
		Costs ($M)	871.1	953.6	847.5
		Balance ($M)	-227.7	-310.2	-204.1
		Cost Recovery	74%	67%	76%
DOMESTIC NON-URBAN OPERATIONS	Passenger and Freight Combined	Revenues ($M)	734.8	734.8	734.8
		Costs ($M)	1024.9	1141.5	991.2
		Balance ($M)	-290.1	-406.7	-256.4
		Cost Recovery	72%	64%	74%
ALL DOMESTIC OPERATIONS	Passenger	Revenues ($M)	228.7	228.7	228.7
		Costs ($M)	431.7	515.9	411.9
		Balance ($M)	-203.0	-287.2	-183.2
		Cost Recovery	53%	44%	56%
ALL DOMESTIC OPERATIONS	Passenger and Freight Combined	Revenues ($M)	872.1	872.1	872.1
		Costs ($M)	1302.8	1469.5	1259.4
		Balance ($M)	-430.7	-597.4	-387.3
		Cost Recovery	67%	59%	69%

(a) Indicates the institutional and organisational system of reporting shown in Figure 7.2. In the case of rail transport, this is effectively the same as the formal structure in Figure 7.1, with appropriate exclusions. Excludes private rail operations.
(b) Indicates the Historical Cost method of treating capital costs.
(c) Indicates the Indexed Historical Cost method of treating capital costs.
(d) Indicates the Incurred Capital Cost method of treating capital costs.
(e) Since urban rail freight is ignored in this study, there is no 'total' category for all urban operations.

TABLE 7.10 - RAIL TRANSPORT COST RECOVERY SUMMARY - PRACTICAL FRAMEWORK[a] - OVERALL - 1974-75

Area of Operation	Class of Operation	Item	Values HC[b]	IHC[c]	ICC[d]
DOMESTIC URBAN OPERATIONS[e]	Passenger	Revenues ($M)	120.4	120.4	120.4
		Costs ($M)	249.9	300.0	240.2
		Balance ($M)	-129.5	-179.6	-119.8
		Cost Recovery	48%	40%	50%
DOMESTIC NON-URBAN OPERATIONS	Passenger	Revenues ($M)	79.0	79.0	79.0
		Costs ($M)	136.8	170.9	126.7
		Balance ($M)	-57.8	-91.9	-47.7
		Cost Recovery	58%	46%	62%
DOMESTIC NON-URBAN OPERATIONS	Freight	Revenues ($M)	614.4	614.4	614.4
		Costs ($M)	831.1	913.6	807.5
		Balance ($M)	-216.7	-299.2	-193.1
		Cost Recovery	74%	67%	76%
DOMESTIC NON-URBAN OPERATIONS	Passenger and Freight Combined	Revenues ($M)	693.4	693.4	693.4
		Costs ($M)	967.9	1084.5	934.2
		Balance ($M)	-274.5	-391.1	-240.8
		Cost Recovery	72%	64%	74%
ALL DOMESTIC OPERATIONS	Passenger	Revenues ($M)	199.4	199.4	199.4
		Costs ($M)	386.7	470.9	366.9
		Balance ($M)	-187.3	-271.5	-167.5
		Cost Recovery	52%	42%	54%
ALL DOMESTIC OPERATIONS	Passenger and Freight Combined	Revenues ($M)	813.8	813.8	813.8
		Costs ($M)	1217.8	1384.5	1174.4
		Balance ($M)	-404.0	-570.7	-360.6
		Cost Recovery	67%	59%	69%

(a) Indicates the institutional and organisational system of reporting shown in Figure 7.2. In the case of rail transport, this is effectively the same as the formal structure in Figure 7.1, with appropriate exclusions. Excludes private rail operations.
(b) Indicates the Historical Cost method of treating capital costs.
(c) Indicates the Indexed Historical Cost method of treating capital costs.
(d) Indicates the Incurred Capital Cost method of treating capital costs.
(e) Since urban rail freight is ignored in this study, there is no 'total' category for all urban operations.

systems, and they are also rather specialised in nature. Therefore, the BTE judged an 'overall' analysis on this basis to be legitimate. This is reinforced if the term 'overall' in Table 7.10 is read as meaning 'all government activities'.

As in the statements of cost recovery by individual sectors (Tables 7.7, 7.8 and 7.9), the results in Table 7.10 contain three sets of figures reflecting the different methods of treating capital costs. The overall results given in Table 7.10 could be regarded as estimates of the extent to which end users of government rail transport services meet the costs of providing such services. However, the limitations detailed in Chapter 4 for the corresponding air transport figures should be noted in regard to these rail transport results as well. In addition, the specific exclusion of private rail transport should be noted.

There are few specific conclusions to be drawn from the figures given in Tables 7.7 to 7.10. In line with expectations, the different methods of treating capital costs have a significant influence on apparent levels of cost recovery in most cases. The BTE's assessment that the indexed historical cost (IHC) method is the best measure of resource use and that the incurred capital cost (ICC) method is the best measure of short-term financial viability has already been indicated in earlier Chapters relating to the study of other modes. The same considerations apply to rail transport.

It is frequently asserted that railways are in a 'special' position because of calls to provide substantially under-priced services (such as those to pensioners and other special groups in the community). On the other hand, rail authorities are exempted from certain payments which some other modes are forced to make (e.g. excise on fuel). Rail services are also often heavily protected from otherwise legitimate competition. The BTE recognises that these considerations do apply to rail transport and should be properly accounted for in a full study of rail pricing.

However, the complex equity questions such as those raised above have been defined as outside the realm of this analysis, at least in terms of the theoretical basis developed in Chapter 3. It is fully accepted that there are externalities which could affect the desirability of attributing additional 'notional' revenues[1] to rail transport. While this issue is regarded as being beyond the terms of reference of this study it is worth noting that rail transport is accepted as being particularly susceptible to those complex 'social' demands and conditions.

The figures given in Tables 7.7 to 7.10 are related to the formal structure of the study in Chapter 8 of this Report.

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(1) Such as notional (but not actual) transfers from social welfare authorities for the purposes of supporting special concessions.

CHAPTER 8 - ASSESSMENT OF RESULTS

In preceding Chapters, the question of comparison of results obtained for different tasks has been discussed from time to time. In general, such comparisons have been deemed inadvisable, because of unavoidable inconsistencies between the attribution and allocation assumptions used for various modes (and for tasks within modes). In this Chapter, this theme is developed to take into account factors other than procedural ones as a prelude to a discussion of the results of the study and their possible applications.

Notwithstanding this general objection to the use of the study results for intermodal comparisons, the BTE accepts that such comparisons will be made. Indeed, such a use of the results is implicit in the terms of reference. An expected major use of the results would be in comparisons between different tasks or modes, in an endeavour to justify lower cost recovery ratios or user charges for particular groups of users. For example, it has already been implicitly argued that certain charges levied on air transport should be set in such a way that cost recovery (on some agreed basis) is comparable to that achieved by part of the shipping industry[1]. This is despite the fact that formal cost recovery analysis to compare the performance of air and sea transport on a consistent basis has never previously been undertaken in Australia.

Therefore, the BTE felt that intermodal comparisons would be made, and that in these circumstances, it was desirable that these comparisons should be made in full awareness of some of the problems involved. Accordingly, these problems are discussed in the following paragraphs, in advance of formal discussion of the results.

(1) Cho K., The Australian Government's Air Transport Cost Recovery Programme, Politics, Economics and Business Realities, Studies in Government Business Relationship No. 2, Royal Melbourne Institute of Technology, April 1976, pp.69-70.

INTERMODAL COMPARISONS AND 'COMMERCIAL EQUITY'

The comparisons discussed above are usually based on notions of 'commercial equity'. Such notions are frequently expressed in the context of 'equal opportunity' or 'equal economic conditions' for all firms and instrumentalities, regardless of the similarities or dissimilarities of their functions. Some previously-mentioned pitfalls to this approach and some additional reasons for the inappropriateness of such comparisons are discussed in detail below:

- Differences in data availability and quality cause unavoidable variations in the assumptions adopted for attribution, allocation and valuation of capital between modes (and, in some instances, between tasks within a particular mode). The various cost recovery ratios are therefore not necessarily obtained on a fully consistent basis, despite the best efforts to ensure that this is the case;

- The results only represent estimates of cost recovery ratios in a single year. For obvious reasons, it is probable that the results are only representative to varying degrees in assessing the usual performance of particular transport activities. Improved comparisons would therefore take into account the trend in ratios over a number of years. Unfortunately, because of data and resource constraints, analysis over a period of years could not be undertaken in this particular study. Indeed, this Report indicates the difficult and extensive nature of analysis required for only one year;

- The ratios obtained are the results of a partial analysis based only on attributable financial returns and outgoings. Intangible benefits and costs have necessarily been disregarded, as have the impacts of policy measures(1) which

(1) For example: personal income tax, shadow company taxes for exempt instrumentalities and (in most instances) protective regulations, tariffs, duties and so on.

have very complex effects upon the supply and demand for transport services. In economic terms, the latter impacts amount to covert subsidies and taxes. The complexities of assessing the shares of direct fiscal measures borne by producers and consumers were discussed in detail in Chapter 3. Compared to these, the difficulties of analysing the derived impacts of indirect measures are markedly compounded. For such reasons, most covert subsidies and taxes were not specifically taken into account. Policies which have such effects also vary significantly from task to task. Hence, cost recovery ratios for different tasks may not be strictly comparable because analysis in market or financial terms alone may be inconsistent on this basis;

- Each particular task has a unique set of social costs and benefits (and hence social welfare spinoffs) associated with it. The assessed differences between market and social equilibria of supplies and demands for each task will therefore not be valid, as the net social benefits or costs need not bear any direct relationship to their market equivalents or to each other.

The four unavoidable deficiencies of the analysis discussed above do, however, only partially limit its usefulness. As long as the data, assumptions and methods used, and the relevant undetermined and indeterminable factors are understood, the financial results for each task can be used as a useful part of the required inputs to subjective considerations. However, it is emphasised that such subjective considerations must be undertaken to assess the real or actual past performance of each task. Even more, such considerations must be taken into account in assessing potential future performance. The imperfections of the analysis therefore simply extend the subjectivity of this process, given in any case that subjectivity is inherent because of the importance of intangible benefits and costs in transport markets.

One particular point is that adoption of commercial equity as a basis for determining cost recovery targets could introduce distortions into the economy which might well result in serious welfare losses (and possibly actual financial losses) in the future. Acceptance of commercial equity notions could preclude competition between firms and modes, and hence limit the extent of structural changes both in the transport sector and in the economy in general. Such changes are themselves responses to changes in tastes, incomes, technology and production and marketing patterns. They are necessary for social and economic progress to take place.

Establishment of commercial equity as a basis for determining cost recovery goals would also probably lead to inefficient firms or industries being subsidised at the expense of the public, and efficient firms or industries reaping excess profits. The concept therefore implies social inequity, which is a major concern of governments. Commercially equitable fiscal measures such as road maintenance taxes are notoriously unpopular.

The major general conclusion which can be drawn from this discussion is that comparisons of cost recovery ratios for different tasks are rarely valid. This applies as a general rule, but has equal application to the results presented in this Report. The results for each task should be considered on their individual merits, taking into account the appropriateness of the assumptions adopted, the reliability of the data and the acceptability of any analyses which were performed. Subjective judgements concerning the level of social benefits and costs pertaining to a particular task should also be taken into account.

FORMAL RESULTS SUMMARY

In each of the Chapters dealing with individual modal cost recovery analyses, a 'practical' framework within which cost recovery could be analysed was established. In each case, this framework was developed from the formal structure of the study, but with particular variations springing from the different institutional and organisational arrangements applying to each mode of transport in Australia. It was foreshadowed that the results produced in terms of the practical framework would eventually be drawn back into the study's formal structure. However, this process involves some fairly sweeping assumptions, which are outlined below.

In the case of air transport, one particular variation which was found to be necessary was combined treatment of passenger and freight operations. Also, only Commonwealth Government activities could be analysed with regard to international operations, due to data problems associated with assessment of operations by international carriers. However, the BTE felt that these restricted results could be forced into the formal structure of the study without undue additional error. This is done by treating the combined passenger and freight results as if they apply to passenger travel alone. Although freight carriage is no doubt important to airlines and other organisations involved in air transport, it is in some ways peripheral to the main thrust of current air transport operations. In particular, cost recovery by the Commonwealth Government sector is heavily geared to passenger travel. The BTE could not, of course, do anything to improve the situation regarding data unavailability for international airline operations. This is a notional problem for which no ready solution is apparent.

Similar constraints affected the study of sea transport, although in somewhat different directions. It was found impossible to separate passenger and freight operations for coastal shipping. This problem is treated in the same way as the corresponding air transport case, except that the combined operations are treated as if they were all related to freight transport. Again, in parallel with air transport, it was found that international operations by shipping lines could not be analysed, although cost recovery from international shipping by other sectors was determined. For the sake of consistency, ports and harbours authorities are treated together with coastal shipping lines for the formal treatment of coastal shipping operations. Other minor simplifications were required to transcribe the sea transport results from the practical framework used in Chapter 5 to the formal structure of the study.

No substantial problems are involved in using the road transport results derived in Chapter 6. These results are already geared to the structure of the study. The only conversion required is addition (with due regard to transfer payments) of the 'infrastructure' and 'operations' subsectors to form an appropriate 'other' sector.

No conversion at all is involved in using the rail transport results within the formal structure of the study, since the practical framework used for the study of rail transport is identical to the formal structure.

Even after these problems of developing consistent results are resolved, two questions regarding presentation of results for comparative assessment remain. The first question relates to the large numbers of results and the variety of permutations of these results which could be presented. In the event, the BTE felt that the most useful results would be those organised on a sector-by-sector basis, with all cost recovery by the Commonwealth Government (say) treated in the same group.

The second question relates to the three separate methods used to treat capital costs. The BTE's assessment of the relevance of each method has already been indicated, and there is no real need to repeat the detailed arguments involved in the issue. In essence, the historical cost (HC) method is closest to traditional accounting practices, while the incurred capital cost (ICC) method effectively ignores past investment patterns. However, the indexed historical cost (IHC) method is preferred by the BTE, since it gives the best indication of resource flows in transport. Since assessment of resource flows is the fundamental thrust of much of the BTE's work, the BTE's preferences would always tend to be directed towards measures which reflect such interests. Nevertheless, the value of the ICC method as a measure of the short-term viability of organisations is also recognised. In the event, the BTE decided that the prime results of the study should be presented in terms of the IHC method. If details of results derived by other methods are required, reference should be made to the detailed modal analyses (Chapters 4 to 7).

Since the process of drawing individual modal results into a unified formal structure involves the types of assumptions outlined above, some formal statement of the exact processes involved is necessary. Table 8.1 gives a full list of valid tasks contained in the formal structure of the Study (as shown in Figure 1.1), together with the relevant sectors undertaking recovery. Against each entry, a brief description of the assumptions involved in linking the formal results to individual modal analyses (Chapters 4 to 7) is given. Only those tasks and sectors actually analysed in the study are included in Table 8.1.

With these variations and constraints taken into account, formal cost recovery results calculated by the IHC method are given in Tables 8.2 to 8.5. To give some idea of the scale of financial transactions involved, revenues and costs (and resultant balances) are given as well as cost recovery ratios. Table 8.2 gives results achieved by the Commonwealth Government in terms of the definitions adopted in this study. Table 8.3 gives corresponding results for the State Government sector. 'Other' sector results are given in Table 8.4, and the various definitions applying to this sector should be noted. In general, the 'Other' sector covers commercial undertakings and the quasi-commercial operating agencies owned by governments. However, this sector also includes Local Government and various other activities in certain cases.

TABLE 8.1 - CORRESPONDENCE BETWEEN FORMAL RESULTS AND INDIVIDUAL MODAL ANALYSES

Mode	Area of Operation	Class of Operation	Sector Undertaking Recovery	Comments, etc
AIR	Non-Urban Domestic	Passenger	Commonwealth Government	All freight activities included with passenger activities
	Non-Urban Domestic	Passenger	Other	Airline operations; freight included with passengers
	International	Passenger	Commonwealth Government	All freight activities included with passenger activities
SEA	Non-Urban Domestic	Freight	Commonwealth Government	Equivalent to 'coastal' area of operation in Chapter 5. Passenger activities included with freight.
	Non-Urban Domestic	Freight	State Government	As above.
	Non-Urban Domestic	Freight	Other	As above, but combines coastal operators and ports and harbours authorities.
	International	Freight	Commonwealth Government	Passenger activities included with freight.
	International	Freight	State Government	As above.
	International	Freight	Other	As above, but comprises only ports and harbours activities. International shipping lines excluded.
ROAD	Urban	Passenger	Commonwealth Government	As in Chapter 6.
	Urban	Passenger	State Government	As in Chapter 6.
	Urban	Passenger	Other	Infrastructure and operations subsectors combined. Note special treatment of private passenger vehicles (See Chapter 6).
	Urban	Freight	Commonwealth Government	As in Chapter 6.

TABLE 8.1 - (CONTINUED) CORRESPONDENCE BETWEEN FORMAL RESULTS AND INDIVIDUAL MODAL ANALYSES

Mode	Area of Operation	Class of Operation	Sector Undertaking Recovery	Comments, etc
	Urban	Freight	State Government	As in Chapter 6.
	Urban	Freight	Other	Infrastructure and operations subsectors combined. Note special treatment of ancillary freight transport (See Chapter 6).
	Non-Urban Domestic	Passenger	Commonwealth Government	Equivalent to 'rural' in Chapter 6.
	Non-Urban Domestic	Passenger	State Government	As above.
	Non-Urban Domestic	Passenger	Other	As above. Infrastructure and operations subsectors combined. Note special treatment of private passenger vehicles (See Chapter 6).
	Non-Urban Domestic	Freight	Commonwealth Government	Equivalent to 'rural' in Chapter 6.
	Non-Urban Domestic	Freight	State Government	As above.
	Non-Urban Domestic	Freight	Other	As above. Infrastructure and operations subsectors combined. Note special treatment of private passenger vehicles (See Chapter 6).
RAIL	Urban	Passenger	Commonwealth Government	As in Chapter 7. Includes some items pertaining to urban freight (which was not analysed).
	Urban	Passenger	State Government	As above.
	Urban	Passenger	Other	As above.
	Non-Urban Domestic	Passenger	Commonwealth Government	As in Chapter 7.

TABLE 8.1 - (CONTINUED) CORRESPONDENCE BETWEEN FORMAL RESULTS AND INDIVIDUAL MODAL ANALYSES

Mode	Area of Operation	Class of Operation	Sector Undertaking Recovery	Comments, etc
	Non-Urban Domestic	Passenger	State Government	As above.
	Non-Urban Domestic	Passenger	Other	As above.
	Non-Urban Domestic	Freight	Commonwealth Government	As above.
	Non-Urban Domestic	Freight	State	
	Non-Urban Domestic	Freight	Other	As above. Excludes private railways.

TABLE 8.2 - FORMAL COST RECOVERY SUMMARY - COMMONWEALTH GOVERNMENT - PASSENGER AND FREIGHT - IHC METHOD[(a)] - 1974-75

Mode	Area of Operation	Passenger Revenues ($M)	Passenger Costs ($M)	Passenger Balance ($M)	Passenger Cost Recovery	Freight Revenues ($M)	Freight Costs ($M)	Freight Balance ($M)	Freight Cost Recovery
AIR	Urban	-	-	-	(b)	-	-	-	(b)
	Non-Urban Domestic	70.8	208.5	-137.7	34%	-	-	-	(c)
	International	32.8	57.9	-25.1	57%	-	-	-	(c)
SEA	Urban	-	-	-	(b)	-	-	-	(b)
	Non-Urban Domestic	-	-	-	(d)	1.2	17.1	-15.9	7%
	International	-	-	-	(d)	15.4	13.1	+2.3	118%
ROAD	Urban	531.5	128.5	+403.0	414%	159.1	71.1	+88.0	224%
	Non-Urban Domestic	334.0	175.8	+158.2	190%	229.1	110.3	+118.8	208%
	International	-	-	-	(b)	-	-	-	(b)
RAIL	Urban	0.8	18.4	-17.6	4%	-	-	-	(b)
	Non-Urban Domestic	0.7	22.5	-21.8	3%	1.3	33.5	-32.2	4%
	International	-	-	-	(b)	-	-	-	(b)

(a) Indicates the Indexed Historical Cost method of treating capital costs.
(b) Not analysed because of irrelevance, insignificant task or data deficiencies (see Chapters 4 to 7).
(c) Included with air passenger transport.
(d) Included with sea freight transport.

TABLE 8.3 - FORMAL COST RECOVERY SUMMARY - STATE GOVERNMENT - PASSENGER AND FREIGHT - IHC METHOD[(a)] - 1974-75

Mode	Area of Operation	Passenger Revenues ($M)	Passenger Costs ($M)	Passenger Balance ($M)	Passenger Cost Recovery	Freight Revenues ($M)	Freight Costs ($M)	Freight Balance ($M)	Freight Cost Recovery
AIR	Urban	-	-	-	(b)	-	-	-	(b)
	Non-Urban Domestic	-	-	-	(b)	-	-	-	(b)
	International	-	-	-	(b)	-	-	-	(b)
SEA	Urban	-	-	-	(b)	-	-	-	(b)
	Non-Urban Domestic	-	-	-	(c)	9.8	13.2	-3.4	74%
	International	-	-	-	(c)	24.7	13.2	+11.5	187%
ROAD	Urban	414.5	450.7	-36.2	92%	124.3	240.1	-115.8	52%
	Non-Urban Domestic	291.5	533.0	-241.5	55%	175.4	375.0	-199.6	47%
	International	-	-	-	(b)	-	-	-	(b)
RAIL	Urban	57.3	119.9	-62.6	48%	-	-	-	(b)
	Non-Urban Domestic	36.8	87.2	-50.4	42%	86.9	254.5	-167.6	34%
	International	-	-	-	(b)	-	-	-	(b)

(a) Indicates the Indexed Historical Cost method of treating capital costs.
(b) Not analysed because of irrelevance, insignificant task or data deficiencies (see Chapters 4 to 7).
(c) Included with sea freight transport.

TABLE 8.4 - FORMAL COST RECOVERY SUMMARY - OTHER[a] PASSENGER AND FREIGHT - IHC METHOD[b] - 1974-75

Mode	Area of Operation	Passenger Revenues ($M)	Passenger Costs ($M)	Passenger Balance ($M)	Passenger Cost Recovery	Freight Revenues ($M)	Freight Costs ($M)	Freight Balance ($M)	Freight Cost Recovery
AIR	Urban	-	-	-	(c)	-	-	-	(c)
	Non-Urban Domestic	475.7	524.0	-48.3	91%	-	-	-	(d)
	International	-	-	-	(c)	-	-	-	(c)
SEA	Urban	-	-	-	(c)	-	-	-	(c)
	Non-Urban Domestic	-	-	-	(e)	283.2	531.2	-248.0	53%[f]
	International	-	-	-	(e)	152.7	205.1	-52.4	74%[g]
ROAD[h]	Urban	371.4	441.2	-69.8	84%	1276.2	1602.9	-326.7	80%
	Non-Urban Domestic	131.5	291.9	-160.4	45%	825.1	943.4	-118.3	87%
	International	-	-	-	(c)	-	-	-	(c)
RAIL	Urban	137.3	328.0	-190.7	42%	-	-	-	(c)
	Non-Urban Domestic	91.4	187.9	-96.5	49%	643.4	953.6	-310.2	67%
	International	-	-	-	(c)	-	-	-	(c)

(a) Note that this definition of 'other' is not the same as the definitions used in Chapters 4 to 7 (see text).
(b) Indicates the Indexed Historical Cost method of treating capital costs.
(c) Not analysed because of irrelevance, insignificant task or data deficiencies (see Chapters 4 to 7).
(d) Included with air passenger transport.
(e) Included with sea freight transport.
(f) Operators and ports and harbours authorities combined.
(g) Ports and harbours authorities only.
(h) Local Government and operating authorities combined. Excludes private vehicle operations.

TABLE 8.5 - FORMAL COST RECOVERY SUMMARY - OVERALL - PASSENGER AND FREIGHT - IHC METHOD[a] - 1974-75

Mode	Area of Operation	Passenger Revenues ($M)	Passenger Costs ($M)	Passenger Balance ($M)	Passenger Cost Recovery	Freight Revenues ($M)	Freight Costs ($M)	Freight Balance ($M)	Freight Cost Recovery
AIR	Urban	-	-	-	(b)	-	-	-	(b)
	Non-Urban Domestic	484.3	670.3	-186.0	72%	-	-	-	(c)
	International	-	-	-	(b)	-	-	-	(b)
SEA	Urban	-	-	-	(b)	-	-	-	(b)
	Non-Urban Domestic	-	-	-	(d)	335.9	604.9	-269.0	56%
	International	-	-	-	(b)	-	-	-	(b)
ROAD	Urban	1159.0	807.6	+351.4	144%	1320.7	1673.9	-353.2	79%
	Non-Urban Domestic	550.2	793.9	-243.7	69%	848.0	1065.2	-217.2	80%
	International	-	-	-	(b)	-	-	-	(b)
RAIL	Urban	120.4	300.0	-179.6	40%	-	-	-	(b)
	Non-Urban Domestic	79.0	170.9	-91.9	46%	614.4	913.6	-299.2	67%
	International	-	-	-	(b)	-	-	-	(b)

(a) Indicates the Indexed Historical Cost method of treating capital costs.
(b) Not analysed because of irrelevance, insignificant task or data deficiencies (see Chapters 4 to 7).
(c) Included with air passenger transport.
(d) Included with sea freight transport.

Overall results are given in Table 8.5. Those results give some indication of those parts of the costs of providing services which are met by end users. However, there are several qualifications to these results, and reference should be made to the separate modal analyses (Chapters 4 to 7). In particular, the special treatment of private motor vehicles and ancillary freight operations should be noted. Also, a general point is that the 'costs of providing services' are only those costs incurred by the sectors included in the analyses. This excludes massive external costs such as those incurred in manufacturing vehicles and other transport equipment. Although these latter costs can justifiably be regarded as outside the frame of reference of this study, the fact remains that the results in Table 8.5 are distorted because of this. However, the results in Table 8.5 can be treated as indicating the extent to which users pay for services provided by agencies and governments analysed in this study. Although this is a limited and incomplete definition of cost recovery in transport, the results are doubtless useful in this context.

DISCUSSION OF RESULTS

Specific conclusions from the results presented in Tables 8.2 to 8.5 will no doubt depend on the purposes for which they are used. However, there is some value in discussing the general implications of these results, as well as those of some of the factors affecting them.

As might be expected, the three methods of treating capital costs result in cost recovery ratios of the same relativities for all tasks and modes. The ICC method, which only takes into account capital costs which are actually paid, almost always returns the highest cost recovery ratios(1). This indicates that actual

(1) This is not the case in activities which do not involve capital expenditure. In such cases, the method of treating capital is clearly irrelevant, and the three methods give identical results.

buyers and sellers are price-takers, in the sense that no individual buyer or seller can influence price. Furthermore, they are assumed to have perfect information concerning both current and future market conditions.

In the real world, such circumstances do not apply. This is especially so in the case of transport infrastructure. More usually suppliers are monopolists (whether they are government instrumentalities or not) or they operate within cartels. Consequently, competition on the supply side is often limited, especially in the short term. Producers may therefore be able to fix prices according to rules of their own choosing, without prices necessarily varying with volume as is the usual case when markets operate freely.

The rule recommended by neoclassical static economic theory is that output should be set by producers so that marginal revenue or price equals marginal cost. If pursued throughout a whole economy, such action can be shown mathematically to result in maximisation of social welfare. For this to occur, perfect competition must prevail. However as discussed above, the appropriate assumptions do not apply in the real world. Even if they did, problems of joint or common costs (which have been shown to cause enough difficulty even in a retrospective sense) would make actual marginal costs impossible to determine in many instances. True marginal cost pricing therefore can never occur in an overall sense.

More recent developments in economic theory have shown that in the real world situation in which all economies operate, there is no single 'best' pricing rule for any set of real circumstances(1). Once a single instance of imperfect competition arises, all pricing solutions must differ from those implied by the competitive model, if optimum resource use and social welfare maximization

(1) Lipsey R.G. and Lancaster K., The General Theory of Second Best, Review of Economic Studies, No. 1, 1956.

outlays on interest and reserves set aside for capital replacement do not approach the levels determined by imputation in the HC and IHC methods. The position is of course distorted for some operations, especially those of public enterprises, as such costs are simply not incurred(1). In other cases, these costs may have been met, but are not shown in (or are not separable from) published accounts. This result therefore does not necessarily indicate that the assumptions made concerning depreciation, valuation of capital, and rates of interest on capital are the ways in which various organisations actually deal with or incur such costs. For instance, some organisations may be self-financing while others may borrow extensively. On the other hand, some may meet contingencies as they arise out of cash flows or borrowings while others may build up cash reserves. Despite all this, the BTE (as stated earlier) feels that the IHC method of treating capital costs is more appropriate as an indication of resource use. However, it is fully accepted that this is a matter of judgement and particular interests. The IHC method, incidentally, gives the lowest cost recovery results, since it gives high importance to the value of resources previously committed to transport.

On the same topic, a second feature of the results is that many of the commercially-organised operational tasks attract cost recovery ratios which are less than 100 percent, even when the ICC method of treating capital is applied. Some tasks (such as these performed by government rail and bus services) are well known for regularly operating with deficits. In other cases, such as private bus operations, the differences between the results obtained by the three capital treatment methods clearly indicate that capital costs are of major importance in the relevant tasks. Although operating costs may be exceeded by revenue for these tasks, returns are not sufficient to permit

(1) For many public enterprises, capital costs are simply met out of consolidated revenue. Interest charges and sinking funds are therefore irrelevant to day-to-day operations.

recovery of capital, determined on the basis of the arbitary assumptions used for the HC and IHC methods. This result implies that either these tasks are only commercially viable in the short run, or that the assumptions used have over-valued capital assets or costs.

The large number of cost recovery ratios which are significantly less than 100 percent (especially for those operations in the government sectors) illustrates the importance of intangible net social benefits to society from transport operations. Such ratios indicate that net subsidies are overtly or covertly paid to the relevant operations. Continuation of this situation implies that the net social benefits are sufficient for society to willingly pay for them.

The results achieved for non-operational government activities (such as funding of capital investments) are also interesting. These show marked differences between modes compared to those for the operational tasks. The operational cost recovery ratios tend to be between about 50 to 120 percent, while for the non-operational activities, cost recovery ratios range from virtually zero to several hundred percent.

The results for air transport clearly indicate that assumptions affecting capital costs have a considerable impact on the recovery ratios achieved. When capital costs are inflated to current money values, the cost recovery ratios fall markedly. Since this procedure does approach actual current resource flows fairly closely, attribution based upon historical costs (as opposed to <u>indexed</u> historical costs) clearly represents a covert subsidy to air transport operations in terms of current resource use. This situation is reflected in the IHC results given in Tables 8.2 to 8.5. Furthermore, the closeness of the results achieved by the HC and ICC methods indicates that air transport operators tend to pay interest on loans (and set aside revenues for replacement)on the basis of historical costs.

Commonwealth government activities in sea transport clearly result in effective subsidies to coastal shipping, while much higher cost recovery ratios are achieved from international shipping (although, in terms of the IHC method at least, cost recovery from international shipping is still relatively low). The same trends are evident to varying degrees in the activities of State Governments and ports and harbours authorities. State Government activities (as defined in this study) regarding international shipping tend to attract high (about 190 per cent) cost recovery ratios.

Road transport cost recovery ratios for government activities clearly show that the Commonwealth Government is taxing the consumption of road use in what might be termed a 'general' fashion (through excise, sales tax and so on). The analysis did not take into account the extent to which such taxes could be shifted to markets outside transport. To the extent that this occurs, the ratios reported may be rather higher than those achieved in some notional sense. Nevertheless, in strict and consistent financial terms, cost recovery by the Commonwealth Government through road transport is very high (even with the IHC method).

In the context of road transport, it is worth pointing out again that this analysis also did not take into account social benefits and costs, since they could not be estimated. In the case of roads, many welfare spinoffs are negative, and some have real financial costs to society. For instance, apart from pollution and other disruption to the environment, road transport is directly or indirectly responsible for much police, law court, medical and hospital activity. Road transport also attracts subsidies (and taxes) through manufacturing industries. To some extent, therefore, the high ratios achieved may reflect the fact that the costs to governments of providing these additional services to users of the road system must be recouped, but were not included in the analysis. Although it is a very contentious question, such costs have been estimated by some observers to be sufficient to offset any apparent 'excess' taxation of road users.

The large differences between the cost recovery ratios achieved by the Commonwealth Government, as opposed to all other government authorities, are due to the Commonwealth Government being the major collector of monies from road users. Although these revenues are partly redistributed to State and Local Governments, any such redistributions specific to transport activities are included in this study as revenues to the appropriate governments.

Rail transport cost recovery ratios tend to be fairly low, with figures above 60 per cent being the exception rather than the rule. This accords with the general impression of rail transport financial activities, and some of the factors underlying this situation are detailed in Chapter 7. Commonwealth Government cost recovery in rail transport is very low, due mainly to its provision of grants to the States, but also because the Commonwealth operating authorities are treated separately.

IMPLICATIONS OF THE RESULTS

In Chapter 1, it was emphasised that cost recovery studies are aimed at assessing the past performances of various types of organisations. Chapter 3 includes a discussion of issues involved in establishing procedures for carrying out such assessments. These are emphasised in Chapters 4, 5, 6 and 7, which detail the intricacies of the assumptions which were made, as well as the unavoidable inconsistencies between those made for different modes and tasks. This Chapter commenced with a discussion of the need to consider most results individually on their own merits. The preceding section approached the results of the study in this way, and stated some of the more important general conclusions which can be drawn concerning performances in the transport sector in 1974-75. The following discussion covers some of the important factors involved in taking such conclusions further.

The Importance of Expectations

Economies are in a constant state of change, and the outcomes of this study are not necessarily relevant either to events occuring today or to these which might occur in the future.

Because of lack of information concerning the present and the future, any assessments of current and potential transport task performances must be based on expectations. In turn, because experience is limited to the past, expectations must be based on historical events, modified (within some appropriate framework) according to intuitive assessments of future events or conditions.

If expectations are set accurately, greater levels of social welfare can be achieved by individuals, household groups and society as a whole. There are three reasons for this:

- Individuals receive satisfaction from being correct, especially in a society (such as Australia) which is achievement-oriented;

- Accurate expectations permit individuals, firms and governments to plan and act so as to minimise losses and maximise gains with a high degree of certainty;

- Virtually all individuals are risk-averse in the sense that they have limited tolerance of situations involving a high probability of loss. Beyond such levels, they will reject potential gains with low probabilities in favour of more certain lower-level gains. Risk is implied by relatively inaccurate expectations. Therefore, at some threshold limit risk itself becomes a source of dissatisfaction.

The degree of usefulness of cost recovery studies, historical as they are, in accurate formation of expectation depends on the degree of stability of the economy, or at least of those parts of it which are relevant. The past is fundamentally irrelevant, except as it forms a basis for establishing theories concerning interactions and relationships which help in predicting the future. Such theories can never be complete, especially in the social sciences, because of human errors and the occurrence of unforeseen or random events. Only complete stability or stagnation would enable universally correct expectations to be formulated.

PRICING AND INVESTMENT

The major decisions which involve individuals in forming expectations are those involving pricing and investment. It has been suggested in some circles that cost recovery results such as those presented in this report will be very useful for such purposes. This assertion is implicitly based upon two premises, quite apart from the general assumption of sufficient stability in the interaction of economic forces to allow expectations to be formed accurately.

The first of these premises is that prices can be successfully determined in a mechanistic fashion from essentially simple revenue and cost data. The second is that those areas for investment in an economy which will result in greatest welfare production can be determined by financial analysis of parts of the economy viewed in isolation. It can be demonstrated that both of these premises are false in the real world, because they are deterministic.

Pricing

While pricing has been noted as being outside the framework of this study, it is worthwhile pointing out some of the factors which influence the use of these results for pricing purposes. Static economic theory is based on an assumption of purely competitive markets at one point in time. In such markets, all are to be achieved. Hence the old belief that the freeing of markets will invariably enhance social welfare is no longer justifiable. Each case must be considered on its own merits.

The situation is further complicated by actual economies being dynamic rather than static entities. Economic forces (and hence conditions) are continually changing. The static theory generally implies that economic relationships can always be determined and that they are fairly stable over time. In these circumstances, historical information is directly relevant to the future. In practice, this is rarely so and especially it is not the case at present. Over recent years, dramatic changes have taken place in both the world and Australian economies after a generation of relative stability. Decisions concerning future prices must therefore be based on revised expectations of resource availabilities, supplies, demands, prices and outputs, all of which could be anticipated to vary. In some cases, this variation may appear to be almost random.

Under these complex and uncertain circumstances, allocations of historical costs according to accountancy practice to determine future prices are potentially misleading. Apart from the arbitrary nature of the assumptions which must be used to allocate joint or common costs, the biggest problem arises in determining appropriate capital values for unique facilities (and hence in determining depreciation and interest on capital or notional rents). As discussed previously, the usual accountancy method of using historical construction or acquisition costs is not pertinent, unless the investment was undertaken very recently.

Pricing government transport services is further complicated by the fact that welfare spinoffs from them are important considerations. Economists advocate that governments implement direct specific subsidies and charges to compensate for each individual spinoffs in a fashion which simulates market operation. In practice, however, the costs of doing so are often assessed to be greater than the transfers involved. Therefore, governments more often use general taxes, subsidies and regulations (and often actually operate services) to achieve similar outcomes to those which might result from a complex schedule of individual financial transfers.

The appropriate levels of such transfers and other interventions in markets are assessed subjectively through the political process. As mentioned previously, many of the costs and benefits concerned are both non-pecuniary and intangible. These must be weighed against each other according to anticipated public reaction, given legal and budgetary constraints. These factors continually change over time, especially in the light of variations in the quality and intensity of information available to the public concerning social, economic and political issues.

The process of assessment is therefore necessarily a continual one. Since information flows are so important to this process, its efficiency will be improved if financial transfers are made as overtly as possible in the form of direct taxes and subsidies. Such action will permit society to assess the relative values of different programs in terms of their costs in terms of foregone consumption or alternative investments or policies. The use of regulations and indirect taxes and subsidies tends to mask the extent of transfers, and therefore hinders public assessment of government programs. Nevertheless, such measures may often be warranted on efficiency and redistributive grounds. Regulations may be more economical and more equitable than general taxes and subsidies in instances where the beneficiaries of spinoffs are in a minority. However, the basic purposes of regulations may also be difficult to identify, and this can lead to further reductions in the degree to which the desirability of particular measures can be determined.

Investment

The factors discussed above are all relevant to investment decisions. The problems mentioned are in fact amplified for investment, since investment decisions are implicitly based on expectations regarding many prices and quantities over a lengthy time horizon. Pricing involves short-run decisions. Errors of judgement in pricing can be reversed by adopting an experimental or flexible approach to prices. In the case of investment, however, decisions are essentially of a long-term nature and mistakes are easier to make and harder to overcome (at least with minimal losses) once they have been made. This is especially the case with transport infrastructure, where many assets become entrenched in land and its subsequent development.

The static approach to investment decisions involves manipulation of expected streams of financial costs and revenues to achieve some criterion for all alternative propositions. The alternative with the highest value of the selected criterion is then chosen for implementation. In more sophisticated evaluations, potential intangible or unmeasurable social costs and benefits, and potential changes in them, are included in the set of choice criteria and are listed along with financial results for consideration by decision makers.

The approach is a valid and necessary one, but it is subject to a great number of errors and must be applied with caution. The costs and revenues used are most often based on current levels and are assumed to remain at these levels into the future. This is a very simplistic approach to expectation formation, and as such is unlikely to be accurate given the complex interactions involved. On the other hand, very complex approaches to anticipating future prices and quantities can not necessarily be expected to yield better results, especially since the basic important issues can readily become clouded by their very complexity.

The problems encountered in investment analysis are therefore a magnified version of those encountered in determining what the market in the immediate future will bear in a pricing decision. Many prices over a long time horizon must be predicted (implicitly if not explicitly) as an investment analysis is undertaken. For this reason, investment decisions require much more subjectivity than pricing decisions. In a sense, pricing decisions may be considered to be the progenitors of investment measures. Determinism (as contained in cost recovery studies) is rather less relevant to investment than it may be to pricing.

Cost Recovery, Pricing and Investment

The discussion above has shown that the results of cost recovery studies are of varying relevance to pricing decisions and are less relevant again to investment decisions. This conclusion is based on the potential lack of relevance of historical data to the formation of expectations. As emphasised before in discussing the interpretation of the results of the study, each case must be considered on its own individual merits.

Nevertheless, there is a temptation to view cost recovery results and reach conclusions concerning prices (charges, taxes and subsidies[1]) and investment. If cost recovery ratios are low, there tends to be an implication that charges should be raised. It is sometimes further implied that no further investment should take place in that task or mode until an indication is available of investment needs based on the new levels of recovery. In the reverse case, the opposite conclusion would be drawn. Both conclusions could be entirely fallacious in a broader social or economic sense. In view of the degree of aggregation of data used in this study, as well as the existence of intangible and unmeasured social benefits and costs, the BTE cannot either draw or support such conclusions. The other factors discussed in detail above make such an approach untenable.

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(1) A subsidy is simply a negative price or part price to a producer or consumer.

CHAPTER 9 - POLICY INSTRUMENTS AND COST RECOVERY

Previous Chapters of this Report have discussed the issues involved in cost recovery analyses, the results obtained in this study and the use of these results. From each of these discussions, a consistent theme has emerged. In short, cost recovery studies review past performances in a manner which varies in detail to best serve the purposes of the individuals or organisations commissioning or carrying out the studies. Furthermore, comparisons between different cost recovery studies (or, indeed, between different parts of the same study) are of limited value, because of the unique data limitations, analytical assumptions and unmeasured benefits and costs (including intangible ones) which are associated with each particular study or sub-study.

For the latter reason, and because of the historical nature of cost recovery studies, such studies are of varying value in regard to expectation formation. Hence, their value as inputs to pricing and investment decisions is somewhat compromised. Such decisions should ideally be the subject of separate intensive studies. The same reasons as those advanced above also apply to analyses aimed at assessing the effects of varying current policies. Because of the partial, historical and arbitary nature of cost recovery studies, the results of such studies alone are not a sufficient basis on which to estimate the effects of policy alternatives.

It was shown in Chapter 3 that the interaction of supply and demand determines the price and quantity outcomes of market changes. This is because the results of virtually all movements of market equilibria are shared in some proportion between consumers and producers, rather than being borne solely by one or the other. Hence a change in price (through the imposition of taxes, higher user charges, subsidies or other mechanisms) will not necessarily have an equal proportionate effect upon revenues, because the quantity purchased will generally also change in the opposite direction. The actual net result will depend on the particular supply and demand parameters, but will usually be of the nature described here. Similarly, a change in consumers' incomes or tastes which results in changes to quantities purchased will also usually have an impact upon prices. In general, the change will be in the same direction as the causative shift in incomes or tastes. In both these cases, actual revenues will not move proportionately with the attributed charges. Furthermore, since a change in attributed charges and hence revenues also means a change in quantities produced and consumed, costs will also change.

The relationships outlined above are obviously complex even in the unusual cases in which the effects of changes in the price and output of the goods concerned are relatively well-known. The relationships can only be estimated using sophisticated econometric techniques, the requirements and potential errors of which have already been discussed in Chapter 3. Such studies must clearly be undertaken individually, and could not be included in this Report. Nevertheless, the types of current policies which could be applied in Australia for recovering costs (or for adjusting cost recovery rates) are discussed below in a general fashion, with particular emphasis on the potential effects of varying the levels at which they are applied.

POLICY INSTRUMENTS FOR RECOVERING COSTS

In Australia, five types of cost recovery policies are in force. 'Cost recovery' policies in this context are these which have been aimed at assisting transport operations to recover their costs. These five types of policies are as follows:

- User charges;
- Taxes;
- Subsidies;
- Government ownership and operation;
- Regulation.

The nature and some of the effects of these policies are described briefly in the following paragraphs.

User Charges

User charges include all specific charges such as levies, fares, freight charges and tolls. They are paid by users as they use the transport facilities or services concerned. The structures of schedules of such charges are generally discriminatory, in that they differ pro rata from passenger to passenger, commodity to commodity, vehicle to vehicle and route to route. The basis for such discrimination is frequently said to be 'charging what the market can bear'. Hence, rates tend to discriminate (for example) against the more valuable bulky commodities on popular routes.

In many instances (and particularly in the case of State Government instrumentalities) the discriminatory structure of charges has been set for many years, and progressive charge increases have been implemented simply by applying blanket percentage increases(1) to all rates. The basis for the historic discrimination therefore may no longer be valid, as the elasticities and extents of demand, and the pattern of passengers and goods carried, may have varied over time.

Taxes

Taxes can be levied in either a direct or indirect fashion, and may be specific or general in nature. Taxes termed 'direct' are levied upon consumers or users, while indirect taxes are levied upon producers and are passed on (usually only in part, as described in Chapter 3) to consumers. Specific taxes are levied

(1) This is the case with port charges levied by the Maritime Services Board of NSW and is especially applicable to the railway systems owned and operated by State Governments.

on particular goods and services, and have relatively definitive effects, while general taxes are wide ranging in their effects upon all incomes or all expenditures(1).

Taxes can be specifically set aside (or 'hypothecated') to be included in cost recovery for a particular purpose. One such example is that driving licence and registration fees (net of collection costs) are set aside for road construction and maintenance in the States. Similarly, fuel excise paid by domestic airlines is regarded, by definition, as part of the Commonwealth Government's cost recovery in air transport. On the other hand, general taxes are paid into consolidated revenue, which is used for all governmental purposes. Nevertheless, through the need to pay funds out of consolidated revenue to meet the costs of those purposes, there is an implicit goal of recovering the costs of government services associated with general taxes, whether the budget is balanced or not.

Subsidies

Like taxes, subsidies can also be paid in indirect or direct and specific or general fashions to transport undertakings to ensure that they meet their costs. As well as explicit subsidies, there are also implicit ones. In Australia, as in most countries, transport services are priced to some degree according to welfare rather than economic criteria. For instance, pensioners and school children travel at concession rates. In contrast to some private enterprises, subsidies to make up the income foregone by such action are not always specifically paid to transport services owned and operated by governments. However, the generally ready acceptance and funding of the deficits of organisations providing these services at least partly represents an implicit subsidy to such instrumentalities.

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(1) The reasons for levying general as opposed to specific taxes have been discussed in various Chapters of this Report.

Government Ownership and Operation

For various reasons, governments own and operate transport enterprises. Not the least of such reasons are the control of monopolies and the direction of cartels through participation which permits non-price competition and co-operative suasion. The most important basis for such action, however, is that the public good and welfare distributive aspects of transport can perhaps be more effectively regulated if the services concerned are provided by an instrumentality subject to government direction, rather than by a regulated firm or series of firms. As mentioned above, government ownership and operation facilitates the payment and receipt of implicit taxes and subsidies rather than overt direct ones. Such action inhibits adequate public assessment of the performance (and public cost) of operation of such services.

Regulation

The first three measures outlined above relate to more-or-less direct control of costs and revenues. On the other hand, regulations, like government ownership and operation, are essentially aimed at establishing certain levels of output (e.g. motor vehicle or aircraft accidents). The reason for their implementation has already been discussed in earlier Chapters. While some regulations are undoubtedly equitable in a welfare distribution sense, most economists and public policy analysts express the view that regulations tend to benefit the regulated to the detriment of society in general. Sometimes this happens in very devious ways. Regulations definitely form a certain basis (or partial basis) for operations by firms. They thereby remove elements of uncertainty, and hence reduce competition between organisations.

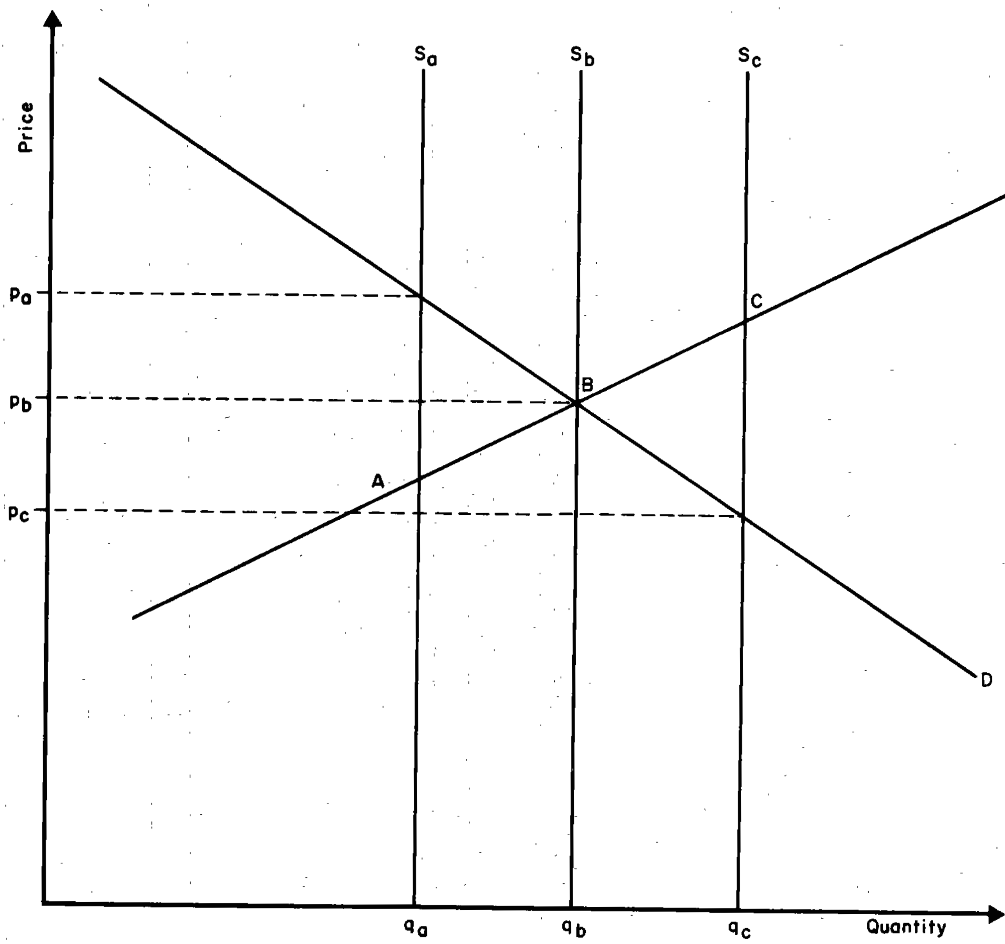
Through their effects on output, and hence on revenues, costs and profits, regulations usually bring about transfers of welfare from one portion of society to another. For instance, the transport regulations which applied in most States until fairly recently resulted in significant transfers to rail transport at the expense of road transport operators. Similarly, the coastal shipping regulations represent a transfer from international shipowners and Australian consumers to domestic coastal shipping operations.

THE IMPACTS OF POLICY INSTRUMENTS

User charges, taxes and subsidies have their impacts directly on the supply and demand for transport services. Changes in user charges cause movements up and down the demand curves, and this results in shifts in supply, given that all other factors remain unchanged. Taxes and subsidies cause upward or downward shifts of either or both the supply and demand curves. This aspect was demonstrated in Chapter 3. On the other hand, government ownership and operation of enterprises and regulation of services directly affects the output of goods and services. Through that mechanism, it causes changes in supply or demand. The situation is demonstrated in Figure 9.1.

The diagrams in Chapter 3 demonstrate that, in the case of user charges, taxes and subsidies, a change in levels disturbs the existing equilibrium situation and adjustment takes place towards a new stable position. The diagrams illustrate static situations. In the real world, the dynamics of market movements have a much greater part to play. Nevertheless, stability prevails with markets in equilibrium, in the sense that change usually takes place in an ordered fashion along a trend.

Under regulation, such adjustment is only possible if the output target is continually adjusted so that it equals the level which would arise from market competition. If this is not done, serious distortions will occur, and will result in welfare losses. Figure 9.1 demonstrates that if output is regulated to the value q_a, excess demand will be encountered. The market would bear a price of p_a and producers could reap excess profits.



LEGEND

D	Demand for service
S	Supply in a competitive-market situation
A, B, C	See text
S_a, S_b, S_c	Supply with output regulated to q_a, q_b and q_c respectively
q_a, q_b, q_c	Regulated output levels
p_a, p_b, p_c	Prices relating to the regulated output levels q_a, q_b and q_c respectively

NOTE: This diagram is drawn as if regulations were intended to force output at an exact level. Normally, regulations intended to force more than or less than some threshold output, and the actual regulated supply will follow the original supply (S) over at least some of its range.

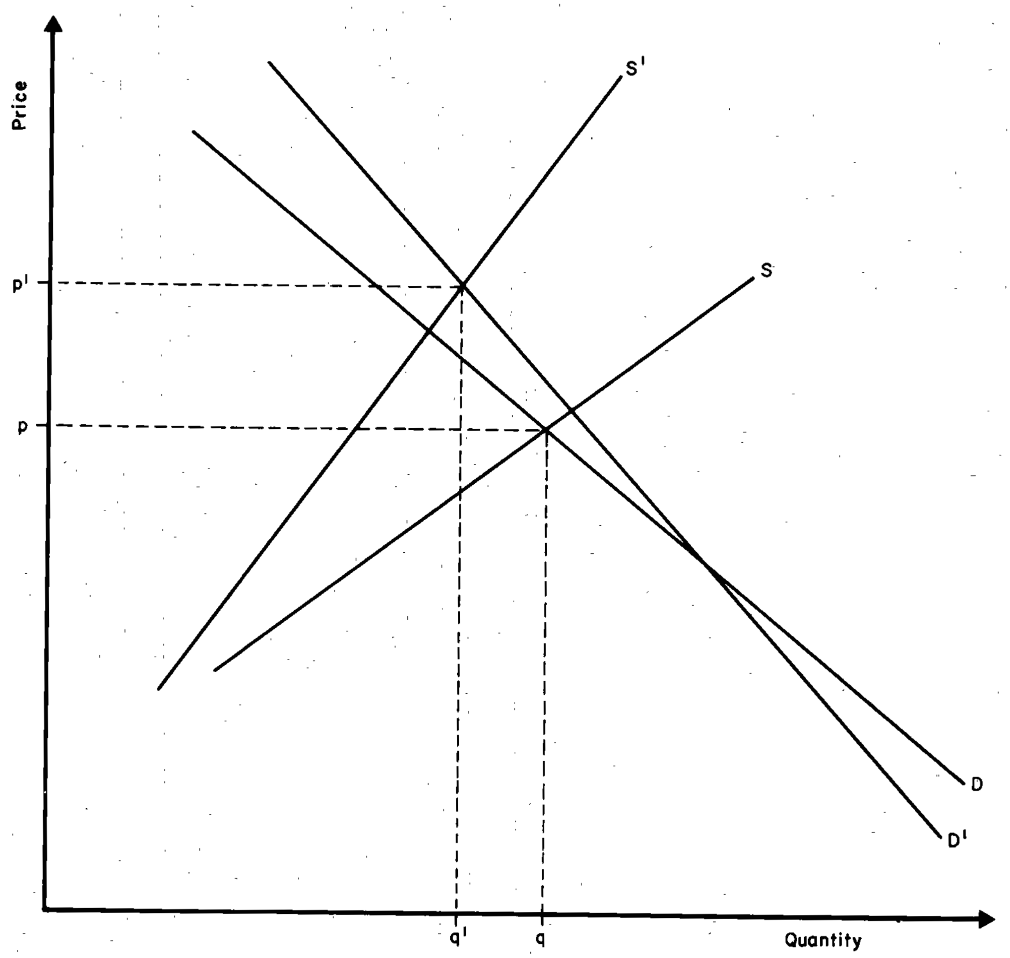
FIGURE 9·1
EFFECTS OF REGULATION ON SUPPLY

The excess profits would arise from the difference between the price at which the producer could supply an output level of q_a (that is, the price at point A) and the price which the market is prepared to bear (p_a). If less than p_a were charged, it could be expected that illegal activity would give rise to a blackmarket which would result in an overall price equal to p_a.

On the other hand, if q_b was chosen as the output target, producers would only produce at price p_b. The effect of the regulation would be completely negated, as producers would simply operate as if fully-competitive free market conditions prevailed. Equilibrium would be achieved at point B. In the third situation, if producers were forced to produce q_c, they would have to be paid a subsidy. Otherwise, they would sustain losses as excess supply would exist and the market would not be cleared. The extent of the subsidy would reflect the difference between p_c and the price given by the point C on the supply curve.

The situation described immediately above is, in effect, what happens to deficit-financed instrumentalities owned and operated by governments. Good examples of these are the railways in their deficit-producing services. Political and social goals require that the outputs of such services should be set higher than those which are financially possible. Overt or covert subsidies are therefore necessary for the continued existence of such organisations.

The extent of impacts of cost recovery policy instruments depends not only on their levels of application, but also (as demonstrated in Chapter 3) on the interaction of supply and demand as indicated by the elasticities of these quantities. Furthermore, these elasticities may not remain constant throughout the adjustment process which follows the imposition of any change in policy goals. In fact, because both information flows and expectations are not perfect, consumers' and producers' perceptions of costs and benefits are likely to change as well. Such changes will result in movements in the slopes of supply and demand functions as shown in Figure 9.2.



LEGEND

D, D'	Demand reflecting different levels of perception by consumers
S, S'	Supply reflecting different levels of perception by producers
p, p'	Price before and after changes in perception
q, q'	Quantity before and after changes in perception

FIGURE 9·2
POSSIBLE EFFECTS OF CHANGES IN PRODUCERS' AND CONSUMERS' PERCEPTION ON SUPPLY AND DEMAND

As information availability improves, producers are able to establish more precise expectations, and hence to postulate more realistic supply relationships. For example, better information on full costs of production may become available. The same situation can occur for consumers. When, say, a new transport service is introduced, consumers may be prepared to pay higher prices for small quantities of such a service compared to a similar established service. When it becomes clear that the service is a very large-scale one, they may be prepared to pay less for a large quantity of that service than for a corresponding amount of an otherwise similar service. These effects are embodied in the representative shifts in supply and demand shown in Figure 9.2.

Private motoring is a good example of a transport service in which perceived costs are most important factors. It is generally conceded that motorists perceive the costs of motoring to include only operating costs and to exclude depreciation, interest on capital and major maintenance. Some groups in society (such as retired persons) may also appear to exclude travel time as a cost. However, this is due to their time having a low opportunity cost.

INFORMATION FLOWS AND THE MERITS OF DIFFERENT POLICY INSTRUMENTS

A significant part of Chapter 3 centered on the differences between market and social equilibrium, and the resultant justifiable levels of cost recovery. The discussion in this Section is primarily concerned with the means of best assessing such differences.

Whereas market positions are known in terms of measured quantities and prices, other factors such as social costs, benefits, demands and supplies can usually only be assessed subjectively, except when specific issues achieve major importance in the political process. This is perfectly legitimate, and is the accepted method of resolving conflicts between social and market forces.

However, even in elections, single policies are rarely subject to referendum in Australia. This is in marked contrast (for example) to the situation at the local government level in the United States.

Individual policies must generally be assessed on the basis of their possible contribution to the success or failure of broader groups of policy intentions. These represent combinations of policies which are complicated by the public expectations concerning the probability and extent of their future implementation. Assessment of the equilibria of social demands and supplies is therefore very difficult by nature, and is the role of the political process. In the final analysis, this process is the ultimate mechanism for allocating responsibility for misjudgements concerning appropriate levels of output and price (i.e. fiscal cost). It is obviously impractical to poll all types of constituencies on every single policy issue. Therefore, it is necessary to make subjective assessments of relative desirabilities versus costs. Such assessments are usually made at the 'policy' level, which is a form of interface between government and the public. The assessments made in this forum are often subsequently modified by discussion and debate.

With time, as the demands on governments have become more numerous and complex, the opportunity for an intensive and meaningful interface at this level has become increasingly limited. Furthermore, the complexity of modern issues and their increasing number also introduces problems of policy assessment which are closely akin to (but far broader than) those faced by commercial management as firms become larger. The outcome of this situation is that the costs of information necessary for making appropriate judgements have become very high. This, in turn, has led to an extensive hierachy of systems by which information is fed to the central political process. This hierachy includes the bureaucracy, lobbyists and active communicative individuals, as well as the normal channels of information flow within the community (e.g. the mass media). At the interface on the political level, such information is filtered and corrected for bias, and is eventually used as an important policy input. Again, this is an entirely legitimate process, and its value is shown by the earlier indications of the impossibility of forming appropriate policies on the basis of objective measurable data alone.

However, because information flows are not perfect and because the costs of mounting concerted information campaigns exceed the benefits of doing so for most individuals on most issues, only interested minorities tend to be very active in providing information to government. It is obviously much cheaper for 40 firms to form a trade association, reach an agreement on government policy matters and present their views, than it is for millions of the members of the public to do the same thing. Secondly, the numbers of issues which markedly affect firms in achieving their goals are likely to be fewer than those affecting the satisfaction of the population as a whole. The potential gains to firms from changes in a particular policy are therefore possibly greater than they are to individuals. Hence, the public appears to be inactive or disinterested with the exception of highly motivated minority groups, while trade associations appear to be very active. In the balance, producers tend to be successful in getting regulations, subsidies and other measures introduced to their benefit. To society in general, this is not the case as the benefits to individuals do mounting appropriate campaigns do not exceed the perceived costs on all but a very few issues from time to time. The public view becomes known to some extent through the media, but its main impact is ultimately through longer-term political processes.

This situation is common to all governments and, indeed, to all organisations. Because information is limited and flows of it are expensive to tap, decision-makers have to rely on advice prepared by others. However, as long as there are sufficient groups with opposing opinions able to present their cases effectively, the points of view presented will more-or-less cover the whole range of public opinion, and a decision will be made which approximates the social equilibrium regardless of the inactiveness of the public.

However, the processes discussed above are very complex and imperfect, and do not always result in 'good' decisions in the sense that they are accurate. In order to ensure that the public is as informed as possible, and therefore may react to policy changes in a manner which will yield as much information as possible, it is best if the costs and benefits of different policies are freely and fully known. In a democratic society, this assurance of information flows is usually said to be the role of the mass media. However, this Report itself indicates the degree of depth of analysis which is required even to estimate the financial operations and performance of transport organisations. Therefore, it is quite possible that real information can be obscured by historical developments which lead to complex financial interactions and a general haziness about the performance of particular institutions. If this is the case for a relatively simple topic such as financial cost recovery in transport, the degree of confusion regarding the complex economic and welfare interactions between transport and society can only be imagined!

One major issue becomes clear from this discussion of the implications of various cost recovery policy instruments. It is that there is a high degree of confusion surrounding cost recovery, and this implies that future policies might well be more valuable if they adopt the specific aim of reversing this situation. This can be done by ensuring that all new policies lead to more positive identification of the aims of particular cost recovery activities.

Regulations, indirect taxes, cross subsidies and non-cash transfer payments[1] ideally should where possible be avoided. In practice, such measures may be necessary for reasons of administrative economy. Nevertheless, taxes and subsidies should be as candid as possible, and business and bureaucratic competition should be encouraged. If the transport system functions with active competition and open identification of legitimate subsidies and so on, decisions will be made which maximise society's welfare given the limited resources available to the economy.

(1) Such as those involved in travel concessions which are not specifically funded by a monetary transfer from the agency responsible for the welfare activity to the agency responsible for providing the transport service.

CHAPTER 10 - CONCLUDING REMARKS

This study of cost recovery in Australian Transport essentially consists of two more-or-less distinct parts. In the first instance, this Report describes a method for performing a cost recovery study and the results actually obtained in the study. This analysis was undertaken as a review of past performances of a specific part of the transport sector of the Australian economy. While the results of the study are interesting, and are 'appropriate' in the sense that they fulfil the terms of reference of the study as well as possible, they must be regarded as being of limited value. This is especially the case if it is expected that such results can be used directly for future pricing and investment decisions. The second aspect investigated in this Report is covered by discussion of the issues involved in pricing and investment decisions, and the manner in which the commercial and social markets for goods and services are interdependent. The report also emphasises the importance of the political process in ensuring that intangible and non-pecuniary costs and benefits are included in markets for transport infrastructure and services. This is a vital factor in the case of transport, in which such externalities may often outweigh actual cash transfer considerations.

The discussion also highlights dangers inherent in basing policy decisions on the limited results of 'technical' analysis. It is conceded that analysis of this type is becoming more and more sophisticated, but many important factors still can not be included in deterministic investigations. In a sense, this is a denial of the value of the 'cost recovery' concept itself, if it is applied without due regard to external social and economic influences.

Furthermore, the Report emphasises the trade-off between administrative efficiency and ideal socio-economic procedures in choosing policy instruments. Expectations, perceptions and their dependence on the quality and quantity of information flows are all fundamental to this argument. The basic drive of all users of transport services (and of the community at large, for that matter) to maximise their own satisfaction, in terms of material market goods, as well as in regard to their emotional and other non-pecuniary needs are also central considerations.

The major and recurring conclusion of the Report is that a cost recovery study is a means to an end, but is not necessarily an end in itself. Such studies simply make a partial contribution to the major decisions of governments (or of firms). Furthermore, although cost recovery studies may indicate those areas in which further research may be warranted, even this is not necessarily so. Research of this nature is only justifiable if the benefits which it is expected to generate will exceed costs. Since many aspects of transport costs and benefits are partially non-pecuniary or non-measurable, and can be expected to remain so, they must by nature judged subjectively. The potential value of research into these areas is therefore purely a matter of opinion.

The results of the study contained few surprises. In general, the various operational areas investigated have cost recovery ratios appropriate to the common perceptions of their performances, as expressed in past ad hoc assessments by various agencies, including the media. Far greater variations are apparent in the case of governments in their non-operational roles (policy, funding, regulation and so on). Also, overall cost recovery ratios (regarded as limited 'user pays' figures in the context of this Report) generally tend to be less than 100 per cent. This indicates that society values transport services generally above the values implied by financial markets. This is an important finding in itself. In particular, however, the study highlights the sensitivity of cost recovery analysis in transport to the assumptions made concerning capital. This indicates that capital valuation, rent and depreciation are components which could be used to disguise covert taxes and subsidies. This is not an implication of dishonesty in any sense, but it does reflect a possible misallocation of resources in transport.

Further points flow from this observation. Given the need for candid policies and full identification of costs (along the lines argued in this Report), it would seem to be in the national interest if capital charges were to be made more 'visible'. Such a process would simply make the valuation of capital costs a formal costing objective along with enumeration of other cost elements such as operating costs. In the long run, changes in economic and social circumstances would lead to 'appropriate' capital charging mechanisms and would obviate the need for arbitrary capital costing mechanisms (such as the BTE's preference for the IHC method). Such an approach would seem to have more value as an indicator of governments' fiscal roles of raising taxes and paying subsidies for day-to-day operations, and would deemphasise their current roles as long-term investors in transport infrastructure.

ANNEX A
CAPITAL VALUATION METHODS

Methods of treating capital costs in cost recovery studies were discussed in broad terms in Chapter 3. This Annex gives details of the approaches adopted in this particular study. It also describes the procedures followed, and presents the results of the calculations performed in support of the figures given in the body of this report.

METHODS OF TREATING CAPITAL COSTS

Three separate approaches to treatment of capital costs are used in this Report. These three approaches lead to the identification of three specific methods which were used in determining cost survey results. These methods have been described in limited detail in Chapter 3. The three methods are:

- Historical Cost (HC) Method - this is the traditional accounting practice of assessing asset values on the basis of actual past investment expenditure, with appropriate allowances for depreciation;

- Indexed Historical Cost (IHC) Method - this is essentially the same as the HC method, with the added provision that historical expenditures are indexed forward (to allow for the effects of inflation) prior to the application of depreciation procedures;

- Incurred Capital Cost (ICC) Method - this method excludes imputed capital costs of all kinds, and only includes those capital costs <u>actually</u> paid or set aside. Therefore, depreciation is irrelevant in this method, but specific allocations of funds for asset replacement would be included.

Application of the HC and IHC methods involves estimation of interest on capital or notional rent. It also involves calculation of depreciation from determinations of the capital value of assets based on past investment flows. Such assessments were carried out by the BTE wherever possible. However, in some instances, asset valuations shown in company annual reports for 1974-75 were used, as details of past investments could not be obtained. Accountancy practice essentially bases such estimates on past investment levels, so that there is a high degree of compatibility between these estimates and the BTE's ones. For the ICC method, capital valuations are not required, as only those operating expenses directly related to capital (as shown by published balance sheets) are included as costs. Therefore, no further treatment of the ICC method is included in this following section on determination of capital stocks. However, some factors affecting actual expenditures on capital are discussed.

BTE DETERMINATION OF CAPITAL STOCK - HC AND IHC METHODS

For the HC and IHC methods of treating capital, levels of past expenditure on capital formation for each area of transport activity were obtained from annual reports, and from the Australian National Accounts(1) and other Australian Bureau of Statistics publications including those detailing public authority finance for State and Local Authorities(2). Information was also obtained from the Commonwealth Bureau of Roads reports on roads in Australia for 1973 and 1975(3). Schedules of investment flows over time were derived from these sources. These schedules were inflated for the IHC method, and were then depreciated for both methods, using a suitable profile to determine capital stocks in 1973-74 and 1974-75. The stocks for these two years were then used to determine the net change in asset values over 1974-75.

(1) ABS, Australian National Accounts - National Income and Expenditure, various years, Canberra.
(2) ABS, Public Authority Finance - State and Local Authorities 1973-74, Canberra, 1976.
(3) Commonwealth Bureau of Roads, Roads in Australia 1973 and Roads in Australia 1975, Melbourne.

This analysis was carried out over the period 1945-46 to 1974-75, with the exception of some special cases in which a shorter time-frame was used.

Depreciation Profiles

Three depreciation profiles are applied in the study. The use of particular profiles depends on their appropriateness to different types of assets. Broad details of the three profiles are as follows:

- The uniform (or straight-line) profile is based on the assumption that long-term declines in value occur at a uniform rate over the life of assets;
- The modified uniform profile is similar to the uniform profile, except that maintenance is considered to prevent declines in value for an initial period. This period is usually taken as 5 years in this study. However, exceptions are noted in Table A.1. Asset values are assumed to decline uniformly in a straight-line fashion after this initial period;
- The diminishing balance profile has a non-linear form, and is derived by applying a constant depreciation factor to the remaining value of the asset. This profile is adopted for rolling-stock and vehicle valuation.

The three profiles are illustrated in Figure A.1. The 'X' on the time-axis in that diagram represents the period in years for which no depreciation is considered to occur in the case of the modified uniform profile.

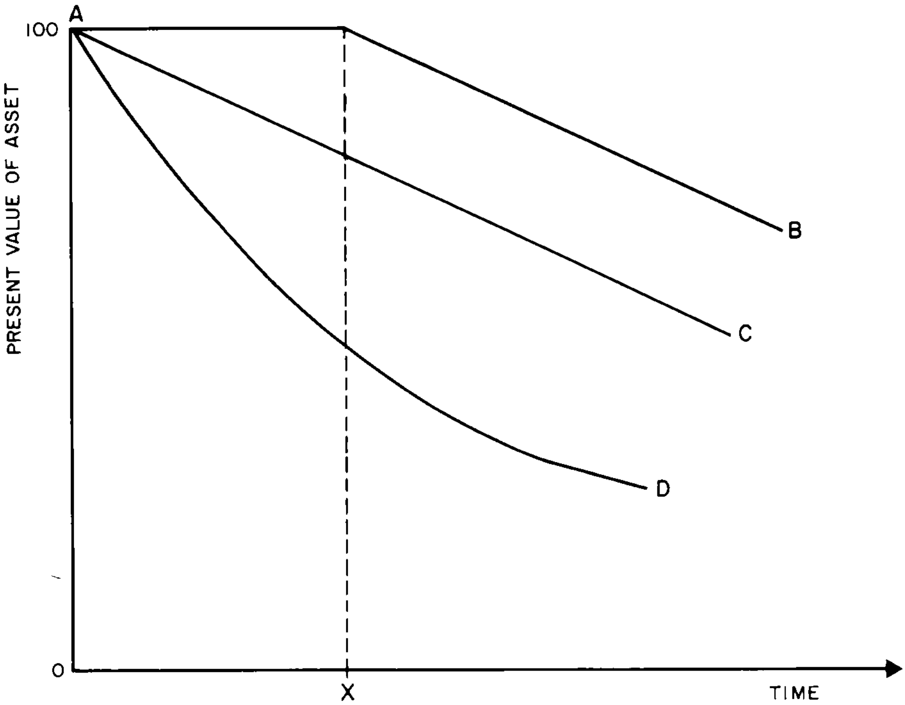
Methods Used for Determining Depreciated Values

It is useful to consider the actual methods used to apply the depreciation profiles described in the preceding paragraphs.

TABLE A.1 - ASSUMPTIONS USED IN THE MODIFIED UNIFORM DEPRECIATION PROFILE

Mode	Nature of Assets	Initial Period of Zero Depreciation
AIR (1)	Buildings and Works	10 years
	Acquisitions and Buildings	10 years
SEA	Commonwealth Government Infrastructure	5 years
	ANL Assets	5 years
	Ports and Harbours	5 years
	Coastal Operators	5 years
ROAD	All Road Infrastructure	5 years
RAIL	All Rail Infrastructure	5 years

(1) Capital investment flows were obtained from the Department of Transport's Annual Report 1974-75. The titles used in that document are adopted for this study.



LEGEND

AB represents the Modified Uniform Depreciation Profile

AC represents the Uniform Depreciation Profile

AD represents the Diminishing Balance Depreciation Profile

X is the number of years of zero depreciation used for the Modified Uniform Depreciation Profile

FIGURE A·1
SCHEMATIC REPRESENTATION OF DEPRECIATION PROFILES USED IN THE CALCULATION OF CAPITAL COSTS

Individual actual capital expenditures in each year were collected and tabulated. For the treatment of capital costs in the IHC method, these annual values were then individually inflated by an index according to the formula:

$$k_i = \frac{K_i}{I_i} \tag{A.1}$$

where K_i is actual capital expenditure in year i,
I_i is the value of an appropriate index in year i,
and k_i is the inflated value of capital expenditure in year i (1974-75 dollars).

The resulting lists of values for each method were then depreciated forward to 1973-74 and 1974-75. The formulae applied to different types of assets under each form of depreciation profile are shown below:

- Uniform Profile-

$$C_{ti} = k_i - k_i\ (t-i)\ r \tag{A.2}$$

- Modified Uniform Profile-

$$C_{ti} = k_i \quad \text{for } (t-i) \leqslant X, \text{ and} \tag{A.3}$$

$$C_{ti} = k_i - k_i\ (t-i-X)\ r \quad \text{for } (t-i) > X \tag{A.4}$$

- Diminishing Balance Profile-

$$C_{ti} = k_i\ (1-r)^{t-i} \tag{A.5}$$

where k_i is the actual (HC method) or indexed (IHC method) capital expenditure in financial year i,
C_{ti} is the calculated asset value of k_i in financial year t,
r is the rate of depreciation,
X is the number of years in which no depreciation initially occurs under a modified uniform profile,
and t is 1973-74 or 1974-75, the last financial year relevant to the analysis.

It should be noted that i, t and X are expressed as simple integer numbers. For example, 1945-46 could be represented by (say) 1 or 46 in which case the respective appropriate values for 1974-75 would be 30 or 75. However, X is a time period (and not a calender year), and hence must be a relative value such as 5 for five years.

The values obtained for each set of investment flows are then summed according to the formula below, in order to obtain capital stock values in 1973-74 or 1974-75 as appropriate:

$$A_t = \sum_{j=1}^{N} C_{tj} \tag{A.6}$$

where A_t is capital stock value in year t,

N is the number of years for which capital investments are included in the determinations,

C_{tj} is the caluclated asset value of K_j in financial year t, as before,

and j is an arbitrary index for the year in which k_j was incurred.

Tables showing investment flows and asset valuations for each type of asset are included at the end of this Annex. Depreciation profiles and rates and the indices applied (if appropriate) in each instance are also included.

Depreciation Rates

As mentioned above, the rates of depreciation which are used are noted on each of the relevant tables. Each rate was chosen either to reflect actual changes in the values of assets over their lifetimes, where markets for the assets concerned actually existed, or alternatively to reflect the potential life and salvage values of such assets. In general, the rates are similar to those applied by Nicholas Clark and Associates[1] in a

(1) Nicholas Clark and Associates, Resources in Transport, 1972-73, Report to the Bureau of Transport Economics 1976 (unpublished).

consultancy study commissioned by the BTE. The rates varied from 2.5 percent to 12.5 percent, depending on the capital item under consideration. In addition to being used to determine capital values, these rates are also applied to capital stock estimates to indicate depreciation in 1974-75 for the HC and IHC methods of treating capital costs.

Index Values

As mentioned previously, indices were chosen to convert capital expenditures and from their actual nominal monetary values (at the time of expenditure) to 1974-75 levels. The indicies selected are considered to be the best available indicators of inflation of the costs of the items concerned. A limiting factor in some cases is that indices were not published over the whole period for which capital flows are analysed, and it was necessary to apply alternative index values. Two indices are used. They are the average minimum wage index and the retail price index, both published by the Australian Bureau of Statistics[(1)]. Their application is shown in each of the IHC method capital valuation tables at the end of this Annex.

Determination of Actual Depreciation

Where past investment schedules were available, depreciation for the HC and IHC methods was determined by using the asset stock values calculated for 1973-74 and 1974-75. For the IHC method calculations, 1973-74 capital stocks are expressed in 1974-75 money values. The change in asset stock value between any two financial years, t and t-1, is the result of capital investment, k_t, in year t and any depreciation, D_t, occurring in that year. Thus, maintaining the notation established earlier in this Annex:

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(1) Sources: ABS, Labour Report No. 57, Canberra, 1972.
ABS, Consumer Price Index, (Various Quarters), Canberra.
ABS, Wage Rates and Earnings, Canberra.

$$A_t - A_{t-1} = \Delta A = k_t - D_t \qquad (A.7)$$

$$D_t = k_t - \Delta A$$

where D_t is the depreciation in year t;
and ΔA is the change in asset stocks between years t-1 and t.

Where capital stock values could not be calculated because of lack of information concerning past investment, depreciation in 1974-75 was determined by multiplying 1974-75 capital stock values as stated in annual reports[(1)] by the appropriate depreciation rate. The tables at the end of this Annex detail the method used to calculate depreciation in each particular case.

Initial Asset Stocks

The main method of determining capital costs in this study was to develop and examine time-streams of actual investment over varying periods. However, this approach ignores the value of asset stocks at the beginning of such periods. These initial values would have effects on depreciation and other capital charges, but is was found impossible to estimate values on a consistent basis. Therefore, such initial values were left out altogether.

This does not lead to major errors, and is probably appropriate in any case for the following reasons:

- The time profiles of investment are usually long (typically more than 25 years). Therefore, any initial assets would have depreciated greatly by the study year;

- Such initial assets would have been restored by rebuilding or intensive maintenance. This is reflected in the figures entered in the time-streams of investment.

(1) This action was necessary for the two major airlines.

DETERMINATION OF INTEREST ON CAPITAL OR NOTIONAL RENT

Interest on capital or notional rent is determined by simply multiplying calculated capital stock values by a rate of interest. In most cases, 10 per cent was used as an appropriate rate. Exceptions for air transport capital stocks are noted in the later parts of this Annex. This rate (10 per cent) represents a rounded approximation to the rates of interest offered in government loan raisings and in loan raisings by government instrumentalities in 1974-75. This value was therefore taken to be a fair approximation to the opportunity cost of capital to most organisations providing transport services in Australia.

The term 'interest on capital' is used to describe the value of capital flows estimated for the HC method of treating capital. It is an approximation to the interest which would be payable at the current rate on actual capital outlays in the past.

On the other hand, 'notional rent' is the term applied to estimates of capital flows in 1974-75 money values, carried out in relation to the IHC method of treating capital. From a purely academic viewpoint, such estimates intuitively approach more closely to real current flows of capital. The indexing incorporated in the capital calculations for this method can be viewed as an attempt to approximate the value in use or real economic worth of capital assets in 1974-75.

Neither interest on capital nor notional rent are determined for the ICC method. Costs of capital are only accomodated in this method by the inclusion of interest actually paid by Departments, instrumentalities and firms, and then only if such figures were published in their annual balance sheets or financial statements.

VARIATIONS IN DETERMINING CAPITAL COSTS

Although the preceding sections have outlined a uniform approach the method of determining capital costs, it was not always possible to apply these methods in a rigid fashion. This section gives some details of variations which were found necessary in the course of the study.

Air Transport Variations

Table A.2 details differences between specific assumptions or procedures discussed above and those which are used in determining capital costs for air transport. The major variations are use of actual interest rates in some cases (rather than the blanket assumption of 10 per cent) and the use of firms' own assessments of asset stocks.

Sea Transport Variations

Table A.3 details differences between specific assumptions or procedures discussed above and those which are used in determining capital costs for sea transport. The major variations are related to rates of depreciation and sources of information on asset stocks.

Road Transport Variations

Table A.4 details differences between specific assumptions or procedures discussed above and those which are used in determining capital costs for road transport. The main variations cover the unusual nature of road rolling stock and associated equipment. No variations were required in the treatment of roads themselves.

Rail Transport Variations

Table A.5 details differences between specific assumptions or procedures discussed above and those which are used in deter-

TABLE A.2 - VARIATIONS OF PROCEDURAL ASSUMPTIONS IN DETERMINING CAPITAL COSTS - AIR TRANSPORT

HC Method

- Commonwealth Government

The interest rate chosen to calculate interest on capital is 7.5 per cent and not 10 per cent. This rate is considered to best reflect the Department of Transport's actual average interest rate on outstanding liabilities, and was derived after inspection of interest rates for previous loan raisings.

- Domestic Airlines (inlcuding TAA)

The net asset value of stocks for the airlines was obtained from their annual reports.

- General Aviation

The rates of depreciation and interest on capital used are 12 per cent and 10 per cent, respectively. These values were taken from Niall's work[a].

IHC Method

Where investment profiles could not be found, published net asset values are used. To convert these values to 1974-75 levels, they are raised by the ratio of asset stock values determined by the IHC method and the HC method for corresponding assets owned by the Commonwealth Department of Transport[b]. Depreciation is then calculated at 12 per cent of the inflated net asset value. Notional rent is assessed as 10 per cent of this value.

ICC Method

This method uses only those capital costs relating to actual replacement provisions, interest, dividends and rents which were actually paid or provided for in the financial statements of the organisations and institutions being examined.

(a) Niall J. op. cit.
(b) This assumption is not unreasonable. Although the relative extents of investment may differ between the airlines and the Department of Transport, it is likely that their patterns of investment over time are rather similar. The relative effects of inflation on the values of similar distributions assets will therefore also tend to be the same.

TABLE A.3 - VARIATIONS OF PROCEDURAL ASSUMPTIONS IN DETERMINING CAPITAL COSTS - SEA TRANSPORT

HC Method

The interest rate chosen for all parts of sea transport is 10 per cent, in accordance with general practice discussed in the section above. The modified uniform depreciation rate used throughout is 3 per cent, with the assets assumed to hold their value without depreciation for the first five years. The net asset value of capital stocks for sectors recovering costs from sea transport were obtained from the Australian National Accounts[(a)]. Coastal operators' assets were obtained from unpublished data estimated by the BTE and from Department of Transport publications[(b)].

. Ports and Harbours Authorities

Actual expenditures from 1963-64 onwards were obtained from the Australian National Accounts in the usual fashion. Expenditures for the previous five years were derived from Clark[(c)].

. Coastal Operators

Because ships scrapped in 1974-75 were on average twenty years old[(d)], depreciation of 5 per cent for vessels is used. The usual 3 per cent depreciation is, however, applied to buildings and other assets.

IHC Method

Depreciation for all parts of sea transport is calculated at 3 per cent of the inflated net asset value. Notional rent is assessed as 10 per cent of this value.

ICC Method

Using this method, only those capital costs relating to actual replacement provisions, interest and rents paid are examined. Relevant information was obtained from the financial statements of the organisations and institutions under examination.

(a) ABS, Australian National Accounts, National Income and Expenditure, op. cit.
(b) Department of Transport, Australian Shipping and Shipbuilding as 30 June, 1975, Canberra, 1975.
(c) Clark, op. cit., p. 233.
(d) Derived from Department of Transport, Australian Shipping and Shipbuilding as at 30 June, 1975, Table No. 17(4).

TABLE A.4 - VARIATIONS OF PROCEDURAL ASSUMPTIONS IN DETERMINING CAPITAL COSTS - ROAD TRANSPORT

HC Method

Rolling stock assets are valued by assuming[a] an average market value for 1974-75 for each type of vehicle being considered and then deflating this value by the CPI for each year (1974-75 CPI = 1.0). Thus a list of average market values for each type of vehicle for a period of fifteen years is obtained. These values are then multiplied by the relevant number of registered vehicles in each of these years. This provides an estimate of the asset values for each grouping of rolling stock, in current prices. A weighted average historic value per vehicle was obtained for this fifteen-year period. This weighted value is then multiplied by the relevant number of registered vehicles in 1974-75 to obtain a measure of the historic asset value of the fleet in 1974-75. Depreciation is calculated as 8.5 per cent of this figure and the imputed interest charge is taken as 10 per cent of the asset value.

Parking and garaging facilities are assumed to represent 35 per cent of the rolling stock asset value[b]. For buses and trams, ancillary assets, such as buildings and depots, are valued[c] at 20 per cent of the asset value of bus and tram rolling stock. The value of tramway was obtained from the 1974 Annual Report of the Melbourne and Metropolitan Tramways Board. The ancillary asset stock, including tramways, is depreciated at 3 per cent and interest was calculated at 10 per cent.

IHC Method

The asset value of rolling stock is calculated by using the assumed 1974-75 average market value of the particular vehicles under consideration. The total asset value is then obtained by multiplying this average market value (in 1974-75 prices) by the total number of vehicles registered in 1974-75. The asset values of ancillary stock, depreciation and interest costs are calculated by the procedures outlined above for the HC method.

ICC Method

No variations required.

(a) This assumed value was based on Clark's estimates.
(b) Ibid.
(c) Based on figures obtained from Annual Reports of various Government bus and tram authorities.

TABLE A.5 - VARIATIONS OF PROCEDURAL ASSUMPTIONS IN DETERMINING CAPITAL COSTS - RAIL TRANSPORT

HC Method

The interest rate chosen to calculate interest on capital is 10 per cent. The rate of modified uniform depreciation used for analysis of rail assets is 3 per cent. This is considered to best reflect the longevity of rail capital equipment. The net asset value of stocks was obtained from series in the Australian National Accounts[a] for 1974-75.

IHC Method

The same interest rate, depreciation rate and data source are used as for the HC Method.

ICC Method

Relevant data on capital costs were obtained from the published annual reports of State and Federal rail bodies.

(a) ABS, Australian National Accounts, National Income and Expenditure, op.cit.

mining capital costs for rail transport. Only minor variations are required to reflect the long life (and hence low depreciation) of rail assets.

CAPITAL COST DETERMINATION - AIR TRANSPORT

As outlined in Chapter 4 (and shown in Figure 4.2), cost recovery for air transport is analysed with regard to two sectors. These sectors are:

- The 'Commonwealth Government' sector, comprising the Commonwealth Government activities in relation to air transport regulation and infrastructure, but excluding its quasi-commercial activities through TAA and QANTAS;
- The 'Other' sector, comprising operations by private-enterprise air carriers (including, in this context) TAA and QANTAS.

Details of capital cost determination for these two sectors within air transport are outlined in the following paragraphs.

'Commonwealth Government' Sector

The only Commonwealth Government assets examined in this study are those of the Commonwealth Department of Transport. Historical capital expenditure by the Department of Transport is recorded in detail in the Department's annual report.(1)

The breakdown of capital expenditure into specific categories in that report is adopted for this study, although it is not precisely in line with other divisions of financial expenditure. The categories analysed in this Annex are as follows:

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(1) Department of Transport, Australian Transport 1973-74, AGPS, Canberra, 1974.

- Buildings and Works, including fittings;
- Air route and airways facilities;
- Aircraft, launches, vehicles, engines, etc;
- Acquisitions and buildings.[1]

Different methods and rates of depreciation are used for determining capital costs in each category. For the first and fourth categories, depreciation is determined by using the modified uniform depreciation method, with an initial constant-value time (in equations (A.3) and (A.4)) of 10 years and a rate of depreciation of 2.5 per cent per annum. The second and third categories are treated by the diminishing balance depreciation method, with a rate of 10 per cent per annum.

Details of actual expenditure within each category, together with depreciated values in 1973-74 and 1974-75, are given in Tables A.6 to A.9. These values are those which apply to the HC method of treating capital costs. Corresponding indexed values for the IHC method are given in Tables A.10 to A.13.

In determining capital costs by the IHC method for these items, the average minimum wage index is used for the first category, and the retail price index is used for the other three categories. This distinction is drawn to compensate for the different levels of labour-intensiveness of expenditures in the four categories.

A summary of capital costs treatments by the HC and IHC methods for the Commonwealth Government sector of air transport is derived in Table A.14. Capital costs assessed by the ICC method were derived directly from financial statements, and are reported (along with sources) in Chapter 4.

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(1) 'Buildings' in this category covers buildings other than terminals.

TABLE A.6 - ASSET STOCK VALUATION - AIR TRANSPORT - COMMONWEALTH GOVERNMENT - BUILDINGS AND WORKS INCLUDING FITTINGS - HC METHOD

Year	Actual Expenditure ($M)	Asset Value at Modified Uniform Depreciation ($M) (r = 0.025; X = 10 years)	
		1974-75	1973-74
1945-46	0.87	0.44	0.46
1946-47	1.50	0.79	0.83
1947-48	2.70	1.49	1.55
1948-49	3.94	2.27	2.36
1949-50	4.69	2.81	2.93
1950-51	6.30	3.94	4.10
1951-52	6.92	4.50	4.67
1952-53	7.15	4.82	5.01
1953-54	5.16	3.74	3.86
1954-55	4.34	3.15	3.26
1955-56	4.92	3.69	3.81
1956-57	4.32	3.35	3.46
1957-58	4.58	3.66	3.78
1958-59	7.12	5.87	6.05
1959-60	4.40	3.74	3.85
1960-61	4.37	3.82	3.93
1961-62	4.66	4.19	4.31
1962-63	4.41	4.08	4.19
1963-64	6.21	5.90	6.05
1964-65	11.01	10.73	11.01
1965-66	16.31	16.31	16.31
1966-67	22.60	22.60	22.60
1967-68	22.70	22.70	22.70
1968-69	29.49	29.49	29.49
1969-70	32.67	32.67	32.67
1970-71	39.74	39.74	39.74
1971-72	28.60	28.60	28.60
1972-73	10.18	10.18	10.18
1973-74	9.25	9.25	9.25
1974-75	9.65	9.65	-
TOTAL	320.78	298.17	291.01

TABLE A.7 - ASSET STOCK VALUATION - AIR TRANSPORT - COMMONWEALTH GOVERNMENT - AIR ROUTE AND AIRWAYS FACILITIES - HC METHOD

Year	Actual Expenditure ($M)	Asset Value at Diminishing Balance Depreciation ($M) (r = 0.1)	
		1974-75	1973-74
1945-46	0.26	0.01	0.02
1946-47	0.36	0.02	0.02
1947-48	0.43	0.03	0.03
1948-49	0.40	0.03	0.03
1949-50	1.29	0.09	0.10
1950-51	1.54	0.13	0.14
1951-52	3.43	0.31	0.34
1952-53	3.45	0.34	0.38
1953-54	3.28	0.36	0.40
1954-55	2.20	0.27	0.30
1955-56	1.34	0.18	0.20
1956-57	1.69	0.25	0.28
1957-58	1.81	0.30	0.33
1958-59	1.83	0.34	0.38
1959-60	1.75	0.36	0.40
1960-61	2.25	0.51	0.57
1961-62	2.46	0.63	0.69
1962-63	3.18	0.90	1.00
1963-64	3.71	1.16	1.29
1964-65	3.47	1.38	1.53
1965-66	3.96	1.53	1.70
1966-67	4.39	1.89	2.10
1967-68	5.10	2.44	2.71
1968-69	5.10	2.71	3.01
1969-70	5.15	3.04	3.38
1970-71	9.00	5.91	6.56
1971-72	6.32	4.61	5.11
1972-73	6.80	5.51	6.12
1973-74	5.95	5.36	5.95
1974-75	6.08	6.08	-
TOTAL	98.48	46.68	45.07

TABLE A.8 - ASSET STOCK VALUATION - AIR TRANSPORT - COMMONWEALTH GOVERNMENT - AIRCRAFT, LAUNCHES, VEHICLES, ENGINES ETC. HC METHOD

Year	Actual Expenditure ($M)	Asset Value at Diminishing Balance Depreciation ($M) (r = 0.1)	
		1974-75	1973-74
1945-46	0.16	0.01	0.01
1946-47	0.39	0.02	0.02
1947-48	0.22	0.01	0.01
1948-49	0.25	0.02	0.02
1949-50	0.60	0.04	0.05
1950-51	0.71	0.06	0.06
1951-52	1.08	0.10	0.11
1952-53	0.41	0.04	0.05
1953-54	0.42	0.05	0.05
1954-55	0.47	0.06	0.06
1955-56	0.86	0.12	0.13
1956-57	1.07	0.16	0.18
1957-58	1.34	0.22	0.25
1958-59	1.66	0.31	0.34
1959-60	1.94	0.40	0.44
1960-61	1.23	0.28	0.31
1961-62	1.15	0.29	0.32
1962-63	1.35	0.38	0.42
1963-64	1.73	0.54	0.60
1964-65	2.24	0.78	0.87
1965-66	1.23	0.48	0.53
1966-67	1.64	0.71	0.78
1967-68	1.81	0.87	0.96
1968-69	2.64	1.40	1.56
1969-70	2.02	1.19	1.33
1970-71	2.40	1.57	1.75
1971-72	3.60	2.62	2.92
1972-73	2.61	2.11	2.35
1973-74	1.99	1.79	1.99
1974-75	9.41	9.41	-
TOTAL	49.04	26.04	18.47

TABLE A.9 - ASSET STOCK VALUATION - AIR TRANSPORT - COMMONWEALTH GOVERNMENT - ACQUISITIONS AND BUILDINGS - HC METHOD

Year	Actual Expenditure ($M)	Asset Value at Modified Uniform Depreciation ($M) (r = 0.025; X = 10 years)	
		1974-75	1973-74
1945-46	1.1	0.55	0.58
1946-47	1.1	0.58	0.61
1947-48	1.1	0.61	0.63
1948-49	1.1	0.63	0.66
1949-50	1.1	0.66	0.69
1950-51	1.1	0.69	0.72
1951-52	1.1	0.72	0.74
1952-53	1.1	0.74	0.77
1953-54	1.1	0.77	0.80
1954-55	1.1	0.80	0.83
1955-56	1.1	0.83	0.85
1956-57	1.1	0.85	0.88
1957-58	0.4	0.32	0.33
1958-59	0.7	0.58	0.60
1959-60	1.5	1.28	1.31
1960-61	4.1	3.59	3.69
1961-62	0.9	0.81	0.83
1962-63	1.2	1.11	1.14
1963-64	0.5	0.48	0.49
1964-65	0.6	0.59	0.60
1965-66	0.3	0.30	0.30
1966-67	0.3	0.30	0.30
1967-68	2.1	2.10	2.10
1968-69	2.1	2.10	2.10
1969-70	1.6	1.60	1.60
1970-71	1.8	1.80	1.80
1971-72	2.8	2.80	2.80
1972-73	5.0	5.00	5.00
1973-74	4.3	4.30	4.30
1974-75	4.6	4.60	-
TOTAL	48.0	42.09	38.05

TABLE A.10 - ASSET STOCK VALUATION - AIR TRANSPORT - COMMONWEALTH GOVERNMENT - BUILDINGS AND WORKS INCLUDING FITTINGS - IHC METHOD

Year	Actual Expenditure ($M)	Average Minimum Wage Index	Real Expenditure ($M)	Asset Value at Modified Uniform Depreciation ($M) (r = 0.025; X = 10 years)	
				1974-75	1973-74
1945-46	0.87	0.12	7.25	3.63	3.81
1946-47	1.50	0.12	12.50	6.56	6.88
1947-48	2.70	0.14	19.29	9.65	11.09
1948-49	3.94	0.15	26.27	15.11	15.76
1949-50	4.69	0.16	29.31	17.59	18.32
1950-51	6.30	0.19	33.16	20.73	21.55
1951-52	6.92	0.23	30.09	19.56	20.31
1952-53	7.15	0.26	27.50	18.56	19.25
1953-54	5.16	0.27	19.11	13.38	13.85
1954-55	4.34	0.28	15.50	11.24	11.63
1955-56	4.92	0.29	16.97	12.73	13.15
1956-57	4.32	0.30	14.40	11.16	11.52
1957-58	4.58	0.31	14.77	11.82	12.19
1958-59	7.12	0.31	22.97	18.95	19.52
1959-60	4.40	0.33	13.33	11.33	11.66
1960-61	4.37	0.34	12.85	11.24	11.57
1961-62	4.66	0.35	13.30	11.90	12.30
1962-63	4.41	0.35	12.60	11.70	12.00
1963-64	6.21	0.36	17.30	16.40	16.90
1964-65	11.01	0.38	29.00	28.70	29.00
1965-66	16.31	0.39	41.82	41.82	41.82
1966-67	22.60	0.41	55.12	55.12	55.12
1967-68	22.70	0.43	52.79	52.79	52.79
1968-69	29.49	0.47	62.74	62.74	62.74
1969-70	32.67	0.50	65.34	65.34	65.74
1970-71	39.74	0.52	76.42	76.42	76.42
1971-72	28.60	0.59	48.47	48.47	48.47
1972-73	10.18	0.65	15.66	15.66	15.66
1973-74	9.25	0.75	12.33	12.33	12.33
1974-75	9.65	1.00	9.65	9.65	-
TOTAL	320.78		827.81	722.28	723.35

TABLE A.11 - ASSET STOCK VALUATION - AIR TRANSPORT - COMMONWEALTH GOVERNMENT - AIR ROUTE AND AIRWAYS FACILITIES - IHC METHOD

Year	Actual Expenditure ($M)	Retail Price Index	Real Expenditure ($M)	Asset Value at Diminishing Balance Depreciation ($M) (r = 0.1)	
				1974-75	1973-74
1945-46	0.26	0.22	1.20	0.06	0.07
1946-47	0.36	0.22	1.60	0.08	0.09
1947-48	0.43	0.23	1.87	0.11	0.12
1948-49	0.40	0.25	1.60	0.10	0.11
1949-50	1.29	0.28	4.61	0.33	0.37
1950-51	1.54	0.30	5.13	0.41	0.46
1951-52	3.43	0.36	9.53	0.84	0.93
1952-53	3.45	0.42	8.21	0.81	0.90
1953-54	3.28	0.44	7.46	0.82	0.91
1954-55	2.20	0.45	4.89	0.59	0.66
1955-56	1.34	0.46	2.91	0.39	0.43
1956-57	1.69	0.48	3.52	0.53	0.59
1957-58	1.81	0.49	3.69	0.62	0.69
1958-59	1.83	0.50	3.66	0.68	0.76
1959-60	1.75	0.51	3.43	0.71	0.79
1960-61	2.25	0.53	4.24	0.97	1.08
1961-62	2.46	0.54	4.56	1.16	1.29
1962-63	3.18	0.54	5.89	1.66	1.84
1963-64	3.71	0.54	6.87	2.16	2.40
1964-65	3.97	0.56	7.09	2.47	2.74
1965-66	3.96	0.58	6.83	2.65	2.94
1966-67	4.39	0.60	7.32	3.15	3.50
1967-68	5.10	0.62	8.23	3.94	4.38
1968-69	5.10	0.63	8.10	4.30	4.78
1969-70	5.15	0.65	7.92	4.68	5.20
1970-71	9.00	0.68	13.24	8.69	9.66
1971-72	6.32	0.72	8.78	6.40	7.11
1972-73	6.80	0.76	8.95	7.25	8.06
1973-74	5.95	0.86	6.92	6.23	6.23
1974-75	6.08	1.00	6.08	6.08	
TOTAL	98.48		174.33	68.87	69.09

TABLE A.12 - ASSET STOCK VALUATION - AIR TRANSPORT - COMMONWEALTH GOVERNMENT - AIRCRAFT, LAUNCHES, VEHICLES, ENGINES ET IHC METHOD

Year	Actual Expenditure ($M)	Retail Price Index	Real Expenditure ($M)	Asset Value for Diminishing Balance Depreciation ($M) (r = 0.1)	
				1974-75	1973-74
1945-46	0.16	0.22	0.73	0.03	0.04
1946-47	0.39	0.22	1.77	0.09	0.10
1947-48	0.22	0.23	0.96	0.06	0.06
1948-49	0.25	0.25	1.00	0.06	0.07
1949-50	0.60	0.28	2.14	0.15	0.17
1950-51	0.71	0.30	2.37	0.19	0.21
1951-52	1.08	0.36	3.00	0.27	0.30
1952-53	0.41	0.42	0.98	0.10	0.11
1953-54	0.42	0.44	0.95	0.10	0.12
1954-55	0.47	0.45	1.04	0.13	0.14
1955-56	0.86	0.46	1.87	0.25	0.28
1956-57	1.07	0.48	2.23	0.33	0.37
1957-58	1.34	0.49	2.73	0.46	0.51
1958-59	1.66	0.50	3.32	0.62	0.68
1959-60	1.94	0.51	3.80	0.78	0.87
1960-61	1.23	0.53	2.32	0.53	0.59
1961-62	1.15	0.54	2.13	0.54	0.60
1962-63	1.35	0.54	2.50	0.71	0.78
1963-64	1.73	0.54	3.20	1.01	1.12
1964-65	2.24	0.56	4.00	1.39	1.55
1965-66	1.23	0.58	2.12	0.82	0.91
1966-67	1.64	0.60	2.73	1.18	1.31
1967-68	1.81	0.62	2.92	1.40	1.55
1968-69	2.64	0.63	4.19	2.23	2.47
1969-70	2.02	0.65	3.11	1.84	2.04
1970-71	2.40	0.68	3.53	2.32	2.57
1971-72	3.60	0.72	5.00	3.65	4.05
1972-73	2.61	0.76	3.43	2.78	3.09
1973-74	1.99	0.86	2.31	2.08	2.31
1974-75	9.41	1.00	9.41	9.41	-
TOTAL	49.04		81.79	35.51	28.97

TABLE A.13 - ASSET STOCK VALUATION - AIR TRANSPORT - COMMONWEALTH GOVERNMENT - ACQUISITIONS AND BUILDINGS - IHC METHOD

Year	Actual Expenditure ($M)	Retail Price Index	Real Expenditure ($M)	Asset Value at Modified Uniform Depreciation ($M) (r = 0.025; X = 10 years)	
				1974-75	1973-74
1945-46	1.1	0.22	5.00	2.50	2.63
1946-47	1.1	0.22	5.00	2.63	2.75
1947-48	1.1	0.23	4.78	2.63	2.75
1948-49	1.1	0.25	4.40	2.53	2.64
1949-50	1.1	0.28	3.93	2.36	2.46
1950-51	1.1	0.30	3.67	2.29	2.39
1951-52	1.1	0.36	3.06	1.99	2.07
1952-53	1.1	0.42	2.62	1.77	1.83
1953-54	1.1	0.44	2.50	1.75	1.81
1954-55	1.1	0.45	2.44	1.77	1.83
1955-56	1.1	0.46	2.39	1.79	1.85
1956-57	1.1	0.48	2.29	1.78	1.83
1957-58	0.4	0.49	0.82	0.65	0.68
1958-59	0.7	0.50	1.40	1.16	1.19
1959-60	1.5	0.51	2.94	2.50	2.57
1960-61	4.1	0.53	7.74	6.77	6.97
1961-62	0.9	0.54	1.67	1.50	1.54
1962-63	1.2	0.54	2.22	2.06	2.11
1963-64	0.5	0.54	0.93	0.88	0.91
1964-65	0.6	0.56	1.07	1.04	1.04
1965-66	0.3	0.58	0.52	0.52	0.52
1966-67	0.3	0.60	0.50	0.50	0.50
1967-68	2.1	0.62	3.39	3.39	3.39
1968-69	2.1	0.63	3.33	3.33	3.33
1969-70	1.6	0.65	2.46	2.46	2.46
1970-71	1.8	0.68	2.65	2.65	2.65
1971-72	2.8	0.72	3.89	3.89	3.89
1972-73	5.0	0.76	6.58	6.58	6.58
1973-74	4.3	0.86	5.00	5.00	5.00
1974-75	4.6	1.00	4.60	4.60	-
TOTAL	48.0		93.75	72.27	72.17

TABLE A.14 - SUMMARY OF CAPITAL COSTS - AIR TRANSPORT - COMMONWEALTH GOVERNMENT - HC AND IHC METHODS - 1974-75

Capital Expenditure Category	Item	Values HC Method ($M)	IHC Method ($M)
Buildings and Works including Fittings	Depreciation	2.49	10.72
	Asset Value	298.17	722.28
	Interest Charges [(a)]	22.36	72.23
Air Route and Airways Facilities	Depreciation	4.47	6.30
	Asset Value	46.68	68.87
	Interest Charges [(a)]	3.50	6.89
Aircraft, Launches, Vehicles Engines, etc.	Depreciation	1.84	2.87
	Asset Value	26.04	35.51
	Interest Charges [(a)]	1.95	3.55
Acquisitions and Buildings [(b)]	Depreciation	0.56	4.50
	Asset Value	42.09	72.27
	Interest Charges [(a)]	3.16	7.23
TOTALS	Depreciation	9.36	24.39
	Asset Value	412.98	898.93
	Interest Charges [(a)]	30.97	89.89

(a) Interest charges are calculated as 7.5 per cent of 1974-75 asset value for the HC method. In the IHC method, this is replaced by a 'notional rent' at 10 per cent of 1974-75 asset value. Also, see text.

(b) See text.

'Other' Sector

As foreshadowed in the earlier parts of this Annex, capital costs for organisations other than the Commonwealth Government were derived directly from financial statements and other associated documents (see Table A.2). The figures obtained are reported directly in Chapter 4.

CAPITAL COST DETERMINATION - SEA TRANSPORT

As outlined in Chapter 5 (and shown in Figure 5.2) cost recovery for sea transport is analysed with regard to four sectors. These sectors are:

- The 'Commonwealth Government' sector, comprising the Commonwealth Government's activities in relation to sea transport regulation and infrastructure but excluding the quasi-commercial activities of ANL.

- The 'State Government' sector, comprising the State Governments' activities in relation to the provision of grants and loans to State Government agencies undertaking sea transport operations This sector excludes all ports and harbours authorities and StateShips in Western Australia.

- The 'Other' sector, comprising operations by private-enterprise shipping operators (including in this context) ANL and StateShips.

- The 'Ports and Harbours Authorities' sector, comprising the various ports and harbours authorities in relation to their activities in sea transport.

Details of capital cost determination for these four sectors within sea transport are outlined in the following paragraphs.

'Commonwealth Government' Sector

The Commonwealth Government assets examined in this study are mainly those of the Commonwealth Department of Transport. Historical capital expenditure by the Commonwealth Government is included in the Australian National Accounts(1). This expenditure includes the Commonwealth Government's investment in navigation aids, vessels and other sea transport infrastructure.

The uniform modified depreciation profile is used to determine capital costs for these assets. A depreciation rate of 3.0 per cent per annum and an initial constant-value time (X in equations (A.3) and (A.4)) of 5 years are the parameters chosen for this profile.

Details of the actual capital expenditures and the depreciated values in 1973-74 and 1974-75 are given in Table A.15. These values are those which apply to the HC method of treating capital costs. Corresponding indexed values for the IHC method are given in Table A.16. The average minimum wage index is used as an inflator for determining the indexed capital costs in the IHC method.

A summary of capital cost treatments by the HC and IHC methods for the Commonwealth Government sector in sea transport is presented in Table A.17 Capital costs assessed by the ICC method were derived directly from financial statements and are reported (along with sources) in Chapter 5.

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(1) Australian Bureau of Statistics, Australian National Accounts - National Income and Expenditure 1974-75, AGPS, Canberra, 1976.

TABLE A.15 - ASSET STOCK VALUATION - SEA TRANSPORT - COMMONWEALTH GOVERNMENT - LIGHTHOUSES, VESSELS AND VEHICLES - HC METHOD

Year	Actual Expenditure ($M)	Asset Value at Modified Uniform Depreciation ($M) (r = 0.03; X = 5 years)	
		1974-75	1973-74
1950-51	0.12	0.05	0.05
1951-52	0.26	0.11	0.12
1952-53	0.21	0.10	0.10
1953-54	0.18	0.09	0.94
1954-55	0.30	0.16	0.17
1955-56	0.25	0.14	0.15
1956-57	0.11	0.06	0.07
1957-58	0.21	0.13	0.13
1958-59	0.23	0.15	0.15
1959-60	0.26	0.17	0.18
1960-61	0.60	0.42	0.44
1961-62	2.36	1.72	1.79
1962-63	2.51	1.91	1.98
1963-64	1.77	1.40	1.45
1964-65	1.13	0.93	0.96
1965-66	0.82	0.70	0.72
1966-67	0.86	0.76	0.78
1967-68	0.97	0.88	0.91
1968-69	1.86	1.75	1.80
1969-70	1.86	1.80	1.86
1970-71	1.19	1.19	1.19
1971-72	0.85	0.85	0.85
1972-73	3.53	3.53	3.53
1973-74	2.11	2.11	2.11
1974-75	2.05	2.05	-
TOTAL	26.60	23.16	22.43

TABLE A.16 - ASSET STOCK VALUATION - SEA TRANSPORT - COMMONWEALTH GOVERNMENT - LIGHTHOUSES, VESSELS AND VEHICLES - IHC METHOD

Year	Actual Expenditure ($M)	Average Minimum Wage Index	Real Expenditure ($M)	Asset Value at Modified Uniform Depreciation ($M) (r = 0.03; X = 5 years)	
				1974-75	1973-74
1950-51	0.12	0.19	0.63	0.25	0.27
1951-52	0.26	0.23	1.13	0.49	0.52
1952-53	0.21	0.26	0.81	0.37	0.40
1953-54	0.18	0.27	0.67	0.33	0.35
1954-55	0.30	0.28	1.07	0.56	0.60
1955-56	0.25	0.29	0.86	0.48	0.51
1956-57	0.11	0.30	0.37	0.22	0.23
1957-58	0.21	0.31	0.68	0.42	0.44
1958-59	0.23	0.31	0.74	0.48	0.50
1959-60	0.26	0.33	0.79	0.53	0.55
1960-61	0.60	0.34	1.76	1.23	1.28
1961-62	2.36	0.35	6.74	4.92	5.12
1962-63	2.51	0.35	7.17	5.45	5.66
1963-64	1.77	0.36	4.92	3.89	4.03
1964-65	1.13	0.38	2.97	2.44	2.52
1965-66	0.82	0.39	2.10	1.79	1.85
1966-67	0.86	0.41	2.10	1.85	1.91
1967-68	0.97	0.43	2.26	2.06	2.12
1968-69	1.86	0.47	3.96	3.72	3.84
1969-70	1.86	0.50	3.72	3.61	3.72
1970-71	1.19	0.52	2.29	2.29	2.29
1971-72	0.85	0.59	1.44	1.44	1.44
1972-73	3.53	0.65	5.43	5.43	5.43
1973-74	2.11	0.75	2.81	2.81	2.81
1974-75	2.05	1.00	2.05	2.05	-
TOTAL	26.60		59.57	49.11	48.39

TABLE A.17 - SUMMARY OF CAPITAL COSTS - SEA TRANSPORT - COMMONWEALTH GOVERNMENT - HC AND IHC METHODS - 1974-75

Capital Expenditure Category	Item	Values	
		HC Method ($m)	IHC Method ($m)
Lighthouses, Vessels and Vehicles	Depreciation	1.3	1.3
	Asset Value	23.2	49.1
	Interest Charges	2.3	4.9

'State Government' Sector

As noted earlier this sector specifically excludes the ports and harbour and shipping activities performed by various State agencies. Only grants and loans paid out and interest, taxes and dividends received by the State Governments has been considered in this sector. Consequently, there is no significant capital expenditure[(1)] relating to the activities analysed in this sector.

'Other' Sector

Capital expenditure profiles pertaining to the operations of the various shipping enterprises comprising this sector generally were not available. However, ANL was an exception in this regard and details of actual capital expenditures for ANL are provided in Table A.18 together with the depreciated asset values in 1973-74 and 1974-75. These values are those which apply to the HC method of treating capital costs. Corresponding indexed values for the IHC method are given in Table A.19. The capital costs of other shipping enterprises were derived directly from published financial statements and other documents (see Table A.3).

Table A.20 provides a summary of capital cost derivations by the HC and IHC methods for ANL's operations. These values are included with those derived for the other shipping operators to provide overall capital charges for the 'other' sector. These overall figures are reported directly in Chapter 5.

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(1) Capital grants paid by the State Governments to the various sea transport bodies have been treated as transfer payments and any capital costs are reflected in the depreciation and interest costs for these bodies.

TABLE A.18 - ASSET STOCK VALUATION - SEA TRANSPORT - OTHER VESSELS AND EQUIPMENT (ANL ONLY)[a]

HC METHOD

Year	Actual Expenditure ($M)	Asset Value at Modified Uniform Depreciation ($M) (r = 0.03; X = 5 years)	
		1974-75	1973-74
1963-64	8	6.3	6.6
1964-65	9	7.4	7.7
1965-66	6	5.1	5.3
1966-67	8	7.0	7.3
1967-68	13	11.8	12.2
1968-69	14	13.2	13.2
1969-70	37	35.9	37.0
1970-71	8	8.0	8.0
1971-72	17	17.0	17.0
1972-73	24	24.0	24.0
1973-74	12	12.0	12.0
1974-75	61	61.0	-
TOTAL	134	208.7	150.3

(a) See Text.

TABLE A.19 - ASSET STOCK VALUATION - SEA TRANSPORT - OTHER VESSELS AND EQUIPMENT (ANL ONLY)[a]
IHC METHOD

Year	Actual Expenditure ($M)	Average Minimum Wage Index	Real Expenditure ($M)	Asset Value at Modified Uniform Depreciation ($M) (r = 0.03; X = 5 years)	
				1974-75	1973-74
1963-64	8	0.36	22.2	17.6	18.2
1964-65	9	0.38	23.7	17.3	20.1
1965-66	6	0.39	15.4	13.1	13.5
1966-67	8	0.41	19.5	17.2	17.8
1967-68	13	0.43	30.2	27.5	28.4
1968-69	14	0.47	29.8	28.0	28.9
1969-70	37	0.50	74.0	71.8	74.0
1970-71	8	0.52	15.4	15.4	15.4
1971-72	17	0.59	28.8	28.8	28.8
1972-73	24	0.65	36.9	36.9	36.9
1973-74	12	0.75	16.0	16.0	16.0
1974-75	61	1.00	61.0	61.0	
TOTAL	217		327.9	350.6	298.0

(a) See text.

TABLE A.20 - SUMMARY OF CAPITAL COSTS - SEA TRANSPORT - OTHER HC AND IHC METHODS (ANL ONLY)[a] - 1974-75

Capital Expenditure Category	Item	Values	
		HC Method ($M)	IHC Method ($M)
Vessels and equipment	Depreciation	2.6	8.4
	Asset Value	208.7	350.6
	Interest Charges	20.9	35.1

(a) See text.

'Ports and Harbours Authorities' Sector

All assets, including wharves, vessels, buildings and lights, owned and operated by various ports and harbour authorities have been examined. Historical capital expenditure by these authorities was obtained from the Australian National Accounts.(1)

The uniform modified depreciation profile is used to determine capital costs for this sector. A depreciation rate of 3.0 per cent per annum and an initial constant-value time (X in equations (A.3) and (A.4)) of 5 years are the parameters chosen for this profile.

Details of the actual capital expenditures and the depreciated asset values in 1973-74 and 1974-75 are given in Table A.21. These values are those relating to the HC method of treating capital costs, whilst corresponding figures for the IHC method are given in Table A.22. The average minimum wage index is again used as the inflator for calculating the indexed capital costs.

Table A.23 provides a summary of capital cost treatments by the HC and IHC methods for the Ports and harbour Authorities sector. Capital costs assessed by the ICC method were derived directly from financial statements and are reported (along with sources) in Chapter 5.

CAPITAL COST DETERMINATION - ROAD TRANSPORT

The derivation of sectors for analysing road transport cost recovery is outlined in Chapter 6, and is shown in Figure 6.2. It should be noted that private and ancillary road transport are given special treatment due to their unusual nature regarding financial costs and revenues. The three sectors analysed in the study are as follows:

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(1) Australian Bureau of Statistics, ibid.

TABLE A.21 - ASSET STOCK VALUATION - SEA TRANSPORT - PORTS AND HARBOUR AUTHORITIES - WHARVES, VESSELS AND EQUIPMENT - HC METHOD

Year	Actual Expenditure ($M)	Asset Value at Modified Uniform Depreciation ($M) (r = 0.03; X = 5 years)	
		1974-75	1973-74
1958-59	26	16.6	17.4
1959-60	27	18.1	18.9
1960-61	26	18.2	19.0
1961-62	24	17.5	18.2
1962-63	27	20.5	21.3
1963-64	41	32.4	33.6
1964-65	45	36.9	38.3
1965-66	50	42.5	44.0
1966-67	45	39.6	41.0
1967-68	43	39.1	40.4
1968-69	55	51.7	53.4
1969-70	49	47.5	49.0
1970-71	53	53.0	53.0
1971-72	73	73.0	73.0
1972-73	61	61.0	61.0
1973-74	60	60.0	60.0
1974-75	79	79.0	-
TOTAL	784	706.6	641.5

TABLE A.22 - ASSET STOCK VALUATION - SEA TRANSPORT - PORTS AND HARBOUR AUTHORITIES - WHARVES, VESSELS AND EQUIPMENT - IHC METHOD

Year	Actual Expenditure ($M)	Average Minimum Wage Index	Real Expenditure ($M)	Asset Value at Modified Uniform Depreciation ($M) (r = 0.03; X = 5 years)	
				1974-75	1973-74
1958-59	26	0.31	83.9	53.7	56.2
1959-60	27	0.33	81.8	54.8	57.3
1960-61	26	0.34	76.5	53.5	55.8
1961-62	24	0.35	68.6	50.1	52.1
1962-63	27	0.35	77.1	58.6	60.9
1963-64	41	0.36	113.9	90.0	93.4
1964-65	45	0.38	118.4	97.1	100.7
1965-66	50	0.39	128.2	109.0	112.8
1966-67	45	0.41	109.8	96.6	99.9
1967-68	43	0.43	100.0	91.0	94.0
1968-69	55	0.47	117.0	110.0	113.5
1969-70	49	0.50	98.0	95.1	98.0
1970-71	53	0.52	101.9	101.9	101.9
1971-72	73	0.59	123.7	123.7	123.7
1972-73	61	0.65	93.8	93.8	93.8
1973-74	60	0.75	80.0	80.0	80.0
1974-75	79	1.00	79.0	79.0	
TOTAL			1651.6	1437.9	1394.0

TABLE A.23 - SUMMARY OF CAPITAL COSTS - SEA TRANSPORT - PORTS AND HARBOUR AUTHORITIES - HC AND IHC METHODS - 1974-75

Capital Expenditure Category	Item	Values	
		HC Method ($M)	IHC Method ($M)
Wharves, vessels and equipment	Depreciation	13.9	35.1
	Asset Value	706.6	1437.9
	Interest Charges	70.7	143.8

- The 'Commonwealth Government' sector, comprising the Commonwealth Government's activities in regard to road transport infrastructure, as well as its provision of deficit funding for operations relating to bus services in the ACT and Northern Territory and its assistance to State road-based urban public transport;

- The 'State Government' sector, comprising the State Governments' activities in regard to road infrastructure, as well as their deficit-funding operations relating to bus and tram services;

- The 'Other' sector, which covers Local Government activities in provision of road infrastructure and scheduled bus operations This sector also covers operations by Government and private road passenger transport agencies, as well as those by road freight transport organisations.

For the purposes of the analysis, the 'other' sector is divided into two separate subsectors. These are as follows:

- Infrastructure, covering funding, provision, construction and maintenance of roads, bridges, lights, other road furniture and other facilities related to roads;

- Operations, covering performance of both passenger and freight road transport tasks, excluding those performed by private vehicles. Essentially, this covers hire-and-reward operations by Government and private carriers.

Separate details for infrastructure activities within these three sectors were not available. Therefore, total expenditure profiles are derived for all road transport infrastructure, and are used to develop overall depreciation and interest costs. These costs are further allocated to sectors and tasks on the basis shown in Chapter 6.

TABLE A.24 - ASSET STOCK VALUATION[a] - ROAD TRANSPORT - COMBINED ROAD INFRASTRUCTURE - HC METHOD

Year	Actual Expenditure ($M)	Asset Value at Modified Uniform Depreciation ($M) (r = 0.025; X = 10 years)	
		1974-75	1973-74
1948-49	42	24	25
1949-50	49	29	31
1950-51	62	39	40
1951-52	82	53	55
1952-53	86	58	60
1953-54	92	64	67
1954-55	111	81	83
1955-56	128	96	99
1956-57	144	112	115
1957-58	158	126	130
1958-59	170	140	145
1959-60	195	166	171
1960-61	217	190	195
1961-62	230	207	213
1962-63	264	244	251
1963-64	300	285	293
1964-65	326	318	326
1965-66	351	351	351
1966-67	382	382	382
1967-68	409	409	409
1968-69	440	440	440
1969-70	470	470	470
1970-71	505	505	505
1971-72	543	543	543
1972-73	615	615	615
1973-74	657	657	657
1974-75	831	831	-
TOTAL	8859	7435	6671

(a) Figures are reported to the nearest $M because of reporting procedures adopted in source documents.

TABLE A.25 - ASSET STOCK VALUATION[(a)] - ROAD TRANSPORT - COMBINED ROAD INFRASTRUCTURE - IHC METHOD

Year	Actual Expenditure ($M)	Average Minimum Wage Index	Real Expenditure ($M)	Asset Value at Modified Uniform Depreciation ($M) (r = 0.025; X = 10 years)	
				1974-75	1973-74
1948-49	42	15	280	161	175
1949-50	49	16	306	184	191
1950-51	62	19	326	204	212
1951-52	82	23	357	232	245
1952-53	86	26	331	223	232
1953-54	92	27	341	239	247
1954-55	111	28	396	240	297
1955-56	128	29	441	331	342
1956-57	144	30	480	372	384
1957-58	158	31	510	408	421
1958-59	170	31	548	452	465
1959-60	195	33	591	502	517
1960-61	217	34	638	558	574
1961-62	230	35	657	591	608
1962-63	264	35	754	697	716
1963-64	300	36	833	791	812
1964-65	326	38	858	837	858
1965-66	351	39	900	900	900
1966-67	382	41	932	932	932
1967-68	409	43	951	951	951
1968-69	440	47	936	936	936
1969-70	470	50	940	940	940
1970-71	505	52	971	971	971
1971-72	543	59	920	920	920
1972-73	615	65	946	946	946
1973-74	657	75	876	876	876
1974-75	831	100	831	831	-
TOTAL	7859		17850	16225	15668

(a) Figures are reported to the nearest $M because of reporting procedures adopted in source documents.

The expenditure profiles used to derive these overall cost figures by the HC method are shown in Table A.24. Corresponding profiles for the IHC method are shown in Table A.25. A summary of the infrastructure capital costs derived from these profiles is shown in Table A.26.

As indicated earlier in this Annex, all other capital costs related to road transport infrastructure and operations were derived more-or-less directly from financial statements and other associated documents (see Table A.4). The figures derived are reported directly in Chapter 6.

TABLE A.26 - SUMMARY OF CAPITAL COSTS - ROAD TRANSPORT - COMBINED ROAD INFRASTRUCTURE - HC AND IHC METHODS - 1974-75

Capital Expenditure Category	Item	Values	
		HC Method ($M)	IHC Method ($M)
Roads, bridges, etc.	Depreciation	67	274
	Asset Value	7435	16225
	Interest Charges	744	1623

CAPITAL COST DETERMINATION - RAIL TRANSPORT

As outlined in Chapter 7 (and shown in Figure 7.2), cost recovery for rail transport is analysed with regard to three sectors. These sectors are:

- The 'Commonwealth Government' sector, comprising the Commonwealth Government's activities in relation to rail transport funding and infrastructure, but excluding its operational activities through COMRAIL (later ANR).

- The 'State Government' sector, comprising State Government activities parallel to those of the Commonwealth Government, but excluding the operations of State railways.

TABLE A.27 - ASSET STOCK VALUATION - RAIL TRANSPORT - OTHER[a] - INFRASTRUCTURE AND ROLLING STOCK - HC METHOD

Year	Actual Expenditure ($M)	Asset Value at Modified Uniform Depreciation ($M) (r = 0.03; X = 5 years)	
		1974-75	1973-74
1963-64	87	68.7	71.3
1964-65	92	74.8	78.2
1965-66	117	99.5	102.9
1966-67	120	105.6	109.2
1967-68	126	114.7	118.4
1968-69	124	116.6	120.3
1969-70	133	129.0	133.0
1970-71	137	137.0	137.0
1971-72	156	156.0	156.0
1972-73	150	150.0	150.0
1973-74	150	150.0	150.0
1974-75	215	215.0	-
TOTAL	1607	1516.9	1326.3

(a) Excludes private railways.

TABLE A.28 - ASSET STOCK VALUATION - RAIL TRANSPORT - OTHER[(a)] - INFRASTRUCTURE AND ROLLING STOCK - IHC METHOD

Year	Actual Expenditure ($M)	Average Minimum Wage Index	Real Expenditure ($M)	Asset Value at Modified Uniform Depreciation ($M) (r = 0.03; X = 5 years)	
				1974-75	1973-74
1963-64	87	0.36	241.7	191.0	198.2
1964-65	92	0.38	242.1	198.5	205.8
1965-66	117	0.39	300.0	255.0	264.0
1966-67	120	0.41	292.7	257.6	266.3
1967-68	126	0.43	293.0	266.7	275.5
1968-69	124	0.47	263.8	248.0	255.9
1969-70	133	0.50	266.0	258.0	266.0
1970-71	137	0.52	263.5	263.5	263.5
1971-72	156	0.59	264.4	264.4	264.4
1972-73	150	0.65	230.7	230.7	230.7
1973-74	150	0.75	200.0	200.0	200.0
1974-75	215	1.00	215.0	215.0	-
TOTAL	1607		3072.9	2848.4	2690.3

(a) Excludes private railways.

TABLE A.29 - SUMMARY OF CAPITAL COSTS - RAIL TRANSPORT - OTHER - HC AND IHC METHODS - 1974-75

Capital Expenditure Category	Item	Values	
		HC Method ($M)	IHC Method ($M)
Railways, rolling stock, etc.	Depreciation	24.4	56.9
	Asset Value	1516.9	2848.4
	Interest Charges	151.7	284.8

- The 'Other' sector, comprising the State railways and COMRAIL as quasi-commercial undertakings, but excluding private railways (minerals railways, etc).

In line with these sector definitions, only the 'Other' sector actually possesses rail transport assets. The determination of capital costs for rail transport is therefore confined to that sector.

<u>'Other' Sector</u>

Capital expenditure profiles for the railways analysed in this study are readily available back to 1963-64. These profiles are used to determine asset values for the years 1973-74 and 1974-75. Profiles derived by the HC method are shown in Table A.27, while corresponding profiles derived by the IHC method are shown in Table A.28.

Table A.29 gives a brief summary of capital costs incurred by the railways in 1974-75.