The Parliament of the Commonwealth of Australia

Inquiry into the Efficiency of Road Construction and Maintenance

Report from the House of Representatives
Standing Committee on Transport,
Communications and Infrastructure

December 1993

Australian Government Publishing Service
Canberra

ISBN 0 644 32928 9

Printed by National Capital Printing, Fyshwick ACT.

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1 Replaced Mr Michael Lee MP 23 August 1990.

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PREFACE

Building and maintaining roads is big business. Each year federal, state and local governments spend in total almost $6000m on the task. Our Committee set out to determine how that money could be used more efficiently, how the road dollar could be driven further.

From the outset our work was hindered by the paucity of hard information on how well the money was spent. Several of the Committee's recommendations seek to increase the amount of information available to policy makers on which to base road planning decisions. Also, these recommendations will enable the Parliament to better assess the value received for each road dollar spent.

For too long road debates have centred on how much money is spent each year rather than on how well it is spent. This prompts the comment, that never has so much money been spent by so many people, for so long, with so little information gathered and analyses carried out on how well the money is used.

At the 1991 Special Premiers' Conference it was decided that each level of government would have specific responsibility for particular classes of roads. This development is welcomed as it should enable more effective management of the road network. However, the Committee is concerned that the untying of federal road funding which accompanied this development will result in funds intended for roads being siphoned off to other uses.

The Committee recognises the right of governments at all levels to set financial priorities. However, given the size of the Commonwealth contribution to road funding and the importance of the road network to national economic growth the Committee has recommended that future federal road funding be earmarked to ensure that it is spent on roads.

The Committee was advised that road construction and maintenance in Australia is carried out as efficiently as anywhere in the world. Maintenance of the road network will soon become the major road network management task. Recognising the importance of this development the Committee has recommended that road authorities implement management systems which clearly highlight maintenance requirements.

The 1993 federal election delayed the completion of the inquiry. Since the inquiry began there has been significant improvement in the efficiency of road authorities and in the construction and maintenance of roads. The Committee believes that this report will enable all levels of government to build on the current improvements in road construction and maintenance and to maintain continual improvement in the future.

I thank my fellow Committee Members of the 36th and 37th Parliaments for their interest and assistance during the inquiry and in the preparation of the Committee's report. I would like to thank the Committee's advisors Nelson Waslin and Andy Hrast and Christopher Paterson who was acting secretary to the Committee for most of 1992. Also, I would like to thank the Secretariat staff for their assistance in the conduct of the inquiry and the preparation of the report.

PETER MORRIS MHR
Chairman

THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA

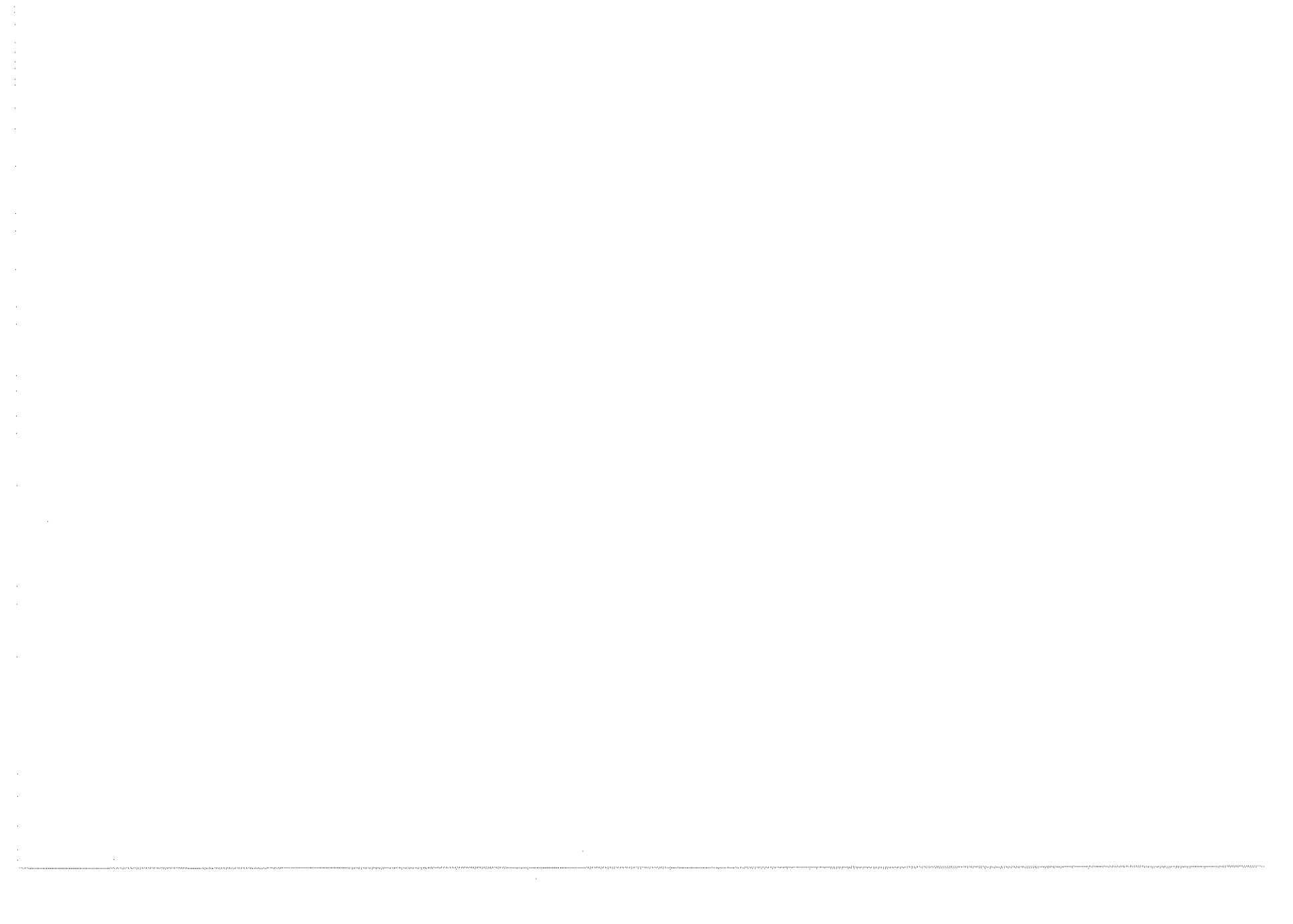
HOUSE OF REPRESENTATIVES STANDING COMMITTEE ON TRANSPORT, COMMUNICATIONS AND INFRASTRUCTURE

DRIVING THE ROAD DOLLAR FURTHER

(Inquiry into the efficiency of road construction and maintenance)

The Minister for Transport and Communications, Senator the Hon Bob Collins, referred the following matter to the Committee for inquiry and report:

> The efficiency of road construction and maintenance in Australia with reference to:
>
> - the use of appropriate new technology, taking into account the environmental effects of road building;
>
> - the development of performance standards for the road system and its usage; and
>
> - the management practices used in road construction and maintenance.



OVERVIEW

1. The Committee's purpose for inquiring into road construction and maintenance was to ensure that the right roads were constructed in the right place, at the right time and that the construction process was as efficient as possible. In short, the Committee was intent on getting more road for each taxpayer dollar spent, it was intent on driving the road dollar further.

Strategic management

2. The Committee examined the objectives set by all levels of government from which the strategic planning for the road network is developed. An effective strategic plan requires a close relationship between the setting of objectives, strategies to achieve those objectives and performance indicators to measure progress in achieving objectives.

3. Unfortunately, the Committee found, at the federal level at least, that there was no clear unambiguous strategic plan for the road network. The Committee accepts that there have been implicit objectives for the National Highway System and that many of these have been achieved, but these objectives have not been explicitly articulated as a strategic plan.

4. Not were there effective procedures in place to ensure that money provided to State, Territory and local governments were used efficiently for road purposes.

5. An examination of Annual Reports indicated that State road authorities do have objectives and strategic plans for their area of road responsibility. However, the quality of these strategic plans is variable.

6. Attempts by the Committee to establish if local councils have set objectives for their area of road responsibility were unsuccessful. Given the size of the local government road task the Committee believes that all local councils should implement a strategic plan for their areas of road responsibility.

7. The Committee recommends that:

1. **The Federal Minister for Housing, Local Government and Community Services require the preparation of a strategic plan, by Councils, for the management of local roads as a condition of federal funding.**

8. Confusion resulting from a lack of a clear strategic outlook has resulted in ineffectiveness and inefficiencies. The Committee believes that there should be clearly set out unambiguous objectives for the entire road network.

9. In association with the requirement for clear objectives the Committee believes that performance indicators need to be put into place to enable meaningful evaluation of road programs.

10. The Committee notes that most State road authorities have recently developed a system of performance indicators for their road networks. At this stage it is unclear how effective these indicators have been.

11. AUSTROADS is developing a set of performance indicators, both for the road network and the performance of SRAs. The performance indicators should enable valid comparisons to be made between the States. If performance indicators are comparable it enables road authorities to make a meaningful assessment of their efficiency and effectiveness against the performance of others. The Committee does not believe that year to year comparisons are valid.

12. Due to the diversity of federal, state and local road programs no specific recommendation in regard to performance indicators has been made. However, the Committee believes that all road authorities should implement a system of performance indicators.

Institutional arrangements

13. Uncertain funding levels and the effects of the Budget cycle were raised often during the inquiry as being impediments to the effective and efficient construction and maintenance of roads. The extent to which these funding problems affect efficiency and effectiveness were not quantified by those suggesting they were a problem.

14. There have been developments in this area which go some way toward alleviating these problems. For example, the Department of Transport and Communications has streamlined administrative procedures for the National Highway System and the 1994 budget has been brought forward.

15. Keeping in mind recent developments in this area there are actions which can be taken to improve the administration of road funding. The Committee is especially concerned that Commonwealth funding for roads disbursed to State and local governments is clearly earmarked as being as such. Accordingly the Committee recommends that:

2. **The Commonwealth government maintain a guaranteed three year funding timeframe for the National Highway System.**

3. **Commonwealth funding to State governments and Councils continue to be earmarked and State governments and Councils be required to verify annually that such funds have been expended on roadworks.**

4.a) **Trust funds be established into which road funds intended for allocation to State Road Authorities and Councils shall be deposited.**

b) **State Road Authorities and Councils have access to such funds for one year from the date of deposit.**

16. The Committee considered that the level of funding provided for roads in relation to other areas of government expenditure was outside its terms of reference. The National Road Transport Commission has a role in setting road user charges and consequently no comment is made on road user charges or road pricing issues.

17. The issue of alternative funding for road projects, toll roads in particular, was raised during the inquiry. Toll roads should only be constructed where they are commercially viable. Also there are other considerations such as alternative free routes and equity and access problems. The Committee recommends that:

5. **The Bureau of Transport and Communications Economics prepare a guideline paper on the viability, construction, operation and equity of toll roads.**

Local Government

18. Considering its responsibility for most of Australia's road network (680,000 klms) the response of local government to the inquiry was indeed disappointing. Late information received by the Committee indicates that local government is taking steps to improve its performance in regard to the provision of roads.

19. The Committee is aware of a joint AUSTROADS and Australian Local Government Association project, the Local Roads Expenditure Summary, designed to improve the performance of local government in administering their road budgets. The Committee recommends that:

6.a) **The Federal Minister for Housing, Local Government and Community Services table the results of the Local Roads Expenditure Summary project in Federal Parliament.**

b) **The Minister for Housing, Local Government and Community Services liaise with the Australian Local Government Association to improve Councils' management of local roads.**

Road construction and maintenance

20. Information available to the Committee indicated that the Australian road construction and maintenance industry is the equal of any of the world. However, there are areas where the construction and maintenance of the road network could improve.

21. The Committee considered the following issues; pavement types, plant utilisation, tendering, project size, day versus contract labour and the development of maintenance management and quality assurance systems.

22. A fair, open and competitive tendering process for road projects was an area of special concern. Keeping in mind the recent revelations concerning the NSW building industry the Committee recommends that:

7. All road authorities should require tenderers to swear an affidavit that they are not involved in collusive dealings.

23. The Committee views the comprehensive introduction of pavement and maintenance management systems as the most effective means of improving construction and maintenance efficiency. Pavement and maintenance management systems are the only means of consolidating national road network data to facilitate planning and evaluation. Accordingly the Committee recommends that:

8. The Department of Transport and Communications accelerate the collection of Pavement Management System data from the States and ensure that the data is comparable.

9.a) The Department of Transport and Communications require the implementation of Maintenance Management Systems on National Highway projects.

b) The Department of Transport and Communications report on the progress of the implementation of PMS and MMS programs in its annual report.

24. The Committee believes that all State governments and councils should introduce pavement and maintenance management systems into their own road networks. It is essential that data from these systems is comparable.

Environment and technology

25. All SRAs and councils must comply with Commonwealth and State environmental protection requirements when planning roads and during actual construction and maintenance. The Committee chose to focus on areas directly related to roads; road side vegetation and dust.

26. The Committee found that there is a close relationship between the environmental concerns and technology. The recycling of pavement, the use of improved bitumen and asphalt surfaces and improved construction techniques are all areas where improvements in technology result in environmental benefits.

27. The adoption of new technology by road authorities is increasing. The Committee was told that in the past SRAs in particular were slow to accept new technology and on occasions not at all. It appears to be the case that SRAs and councils are increasingly taking up new technologies. In particular, recycling technology appears to be increasingly adopted. A report on recycling technology was published by ARRB in 1990. The Committee recommends that:

10.a) The Australian Roads Research Board establish an ongoing project to evaluate road material recycling techniques and their role in improving the efficiency of road construction and maintenance.

b) The project results be made available to government, industry and interested parties.

28. Recognising the importance of new roads technology and the need to adapt it to Australian conditions, the Committee recommends that:

11. AUSTROADS monitor and evaluate the take up rate of cost effective overseas technology by road authorities in Australia.

Summary

29. A disappointing aspect of the inquiry was the lack of information on which the Committee could base its assessment of the efficiency of road construction and maintenance in Australia. In many cases the information that was provided was of poor quality and did not provide a comprehensive national outline of the road network. Thus it was pleasing to note that the collection and analysis of road network information is improving.

30. As mentioned earlier, the Committee's objective is to see the best value for the taxpayers road dollar. Generally, the Committee has found that while in the past management styles and operating procedures may not have gained maximum value for the road dollar, the situation is improving.

31. The Committee believes that there has been improvement in; road management techniques, the monitoring of road network performance, construction and maintenance techniques and the development and adoption of new road technology.

32. Ongoing improvement of road management and construction techniques is the key to driving the road dollar even further. To achieve this end the Committee's recommendations are aimed at improving current road management techniques and construction and maintenance systems so they are better suited to the changing nature of the road management task.

CHAPTER 1
INTRODUCTION

The reference

1.1 On 9 January 1991 the then Minister for Land Transport, the Hon R J Brown MP, agreed to a Committee request that the Committee inquire into and report on the efficiency of the road construction and maintenance industry. The terms of reference specified by the Minister were as follows:

> **The efficiency of road construction and maintenance in Australia with reference to:**
>
> **(a) the use of appropriate new technology, taking into account the environmental effects of road building;**
> **(b) the development of performance standards for the road system and its usage; and**
> **(c) the management practices used in road construction and maintenance.**

Conduct of the inquiry

1.2 The inquiry was advertised in the metropolitan dailies and national newspapers on 12 and 15 June 1991. The Committee also wrote to

State governments and to various industry and local government organisations inviting submissions to the inquiry.

1.3 The inquiry was conducted by the Committee, with sub-committees being appointed on specific occasions for the purpose of conducting public hearings and/or inspections. The Committee commenced the public hearing process in Albury on 6 April 1992 and conducted seven public hearings and seven inspections. Over 80 written submissions were received in the course of the inquiry.

1.4 The Committee also released a Discussion Paper in June 1992. The paper was based on the submissions received and the public hearings conducted up until that time and was intended to distil the issues and provide some focus and obtain feedback for report preparation. The discussion paper listed a series of questions based on those issues and organisations and individuals who had registered an interest in the inquiry were asked to provide written responses to the questions.

1.5 The conduct of the inquiry was interrupted for several months by the 1993 federal elections.

1.6 Details of the conduct of the inquiry, which include the names of persons/organisations who made submissions, those that appeared before the Committee at public hearings and a list of exhibits, appear at Appendix 1.

Efficiency and the terms of reference

1.7 The terms of reference require the Committee to examine a number of specific aspects of road construction and maintenance. To do this the Committee has had to develop criteria to assess the efficiency of the road construction and maintenance system.

1.8 In order to examine the evidence taken in the course of the inquiry, the Committee sought to define what it understood the concept of *efficiency to mean in terms of the management of Australia's road system* and to apply that definition to the terms of reference. Furthermore, while the terms of reference did not specify the consideration of effectiveness, it was raised repeatedly in the inquiry. The Committee considered it was necessary to consider outcomes in terms of efficiency and effectiveness in order to properly address the terms of reference.

1.9 In strict economic terms, economic efficiency is achieved in an economy when, for any given income distribution, someone is made better off without someone else being worse off. In simple terms, this is dependant on outputs being produced at the lowest cost and resources being allocated to the production of the goods and services society requires.

1.10 Efficiency can be seen as having two main meanings. One can look at technical (or productive) efficiency on the one hand and allocative efficiency on the other. Although these two concepts are interrelated, it is useful to draw a distinction between them.

1.11 Technical efficiency relates to the achievement of the highest possible output from a given amount of resources or the maintenance of a level output with the smallest total expenditure of resources. In short, it is concerned with the ratio of inputs to outputs.

1.12 It is difficult to objectively measure technical efficiency in the provision of roads. One possible approach, subject to qualifications, is to make comparisons between the practices of different authorities in the construction and maintenance of roads, drawing attention to any cost differences which might arise from these practices.

1.13 Allocative efficiency is concerned with ensuring that an appropriate amount of a particular good or service is produced, relative to all other goods and services to which scarce resources may be applied, reflecting the preferences of society. In essence, it is about ensuring that the right amount of money is spent in the right place at the right time.

1.14 Allocative efficiency is also difficult to assess. At the most basic level, achieving allocative efficiency in the provision of roads would entail assessing whether an appropriate level of resources is flowing into the roads sector relative to other areas of expenditure. Given the lack of a commercial environment surrounding the provision of roads, cost-benefit analysis could be used to rank roads investment against other possible uses of resources. The Committee considers the question of the level of funding for roads and its priorities to be outside its terms of reference.

1.15 Within the provision of roads, however, there is still an important question as to the appropriate allocation of resources between the construction and maintenance tasks. Evidence provided to the Committee indicated that maintenance will consume an increasing percentage of the road dollar.

1.16 In order to measure economic efficiency the Bureau of Transport and Communications Economics (BTCE) used a benefit-cost ratio technique (BTCE:1990). This measure relies heavily on adequate data being available and measures the benefits in terms of vehicle operating cost savings. In the distribution of funding such an approach favours high traffic volume roads and does not take account of such factors as safety improvements, environmental impact, social improvements and wider potential economic benefits.

1.17 While the BTCE's approach did not deal with construction, it does provide a framework within which the total maintenance task can be assessed which allows for strategies to be developed for various levels of funding. That is, such an approach provides the necessary information for decision makers to make informed decisions regarding the allocation of funds for particular purposes.

1.18 Effectiveness can be considered in conjunction with efficiency and relates to the achievement of desired outcomes in terms of the construction and maintenance task. These outcomes should be related to the objectives set by each level of government. Such an assessment must include an examination of the objectives, as effectiveness is also a product of an

assessment of whether client needs are being met. Consideration must be given, not only, to how the money is being spent but also on what it is being spent.

1.19 Effectiveness relates not simply to objectives but also to questions of allocative efficiency. In the overall planning context, it is important that the processes by which funds are allocated not only between the maintenance and construction tasks are considered as well as the means of determining priorities for expenditure within the maintenance and construction programs.

1.20 Finally it is worth raising the question of comparisons. The use of efficiency and effectiveness comparisons can be made in two ways; year on year comparisons of individual authorities (including federal), and comparisons between authorities.

1.21 The feasibility of making meaningful comparisons between authorities was questioned by many submitters. It would, for example, be possible to make some broad comparisons based on the development and implementation of quality systems, pavement management systems and maintenance management systems. That is, an examination of what programs have been instituted to promote ongoing efficiency and to review and evaluate those efficiency measures.

1.22 In addressing the terms of reference, the report will examine efficiency at two levels:

- Technical Efficiency particularly as it relates to the actual construction processes i.e., producing the maximum output from the resources provided; and
- Administrative Efficiency as it relates to the administration of the roads programs by the three levels of government and the utilisation of effective management techniques.

Structure of the report

1.23 Chapters 2 and 3 are descriptive chapters which describe Australia's road network. Chapter 2 contains a brief history of the Australian road system and describes the road classifications used by governments. Chapter 3 describes the road construction and funding responsibilities of the federal, state and local governments.

1.24 Chapter 4 examines the strategic management of the road network. It looks at the setting of objectives for the road network and the development of performance indicators to measure the extent of progress towards achieving those objectives.

1.25 Chapter 5 looks at the institutional arrangements between governments which affect road construction and maintenance. This chapter contains an analysis of issues associated with road funding and administrative arrangements. Importantly, this chapter also looks at the operations of local government.

1.26 Chapter 6 examines issues associated with the actual construction and maintenance of the road network. Issues which are examined are pavement management and construction, the utilisation of road plant, the tendering process, project size, day labour versus contract labour, maintenance and quality assurance.

1.27 Environmental concerns and road construction and maintenance technology are covered in Chapter 7. Consideration of environmental issues has been restricted to the actual construction process. An important aspect is how recycling technology is able to alleviate environmental problems.

Audit report

1.28 Audit Report No. 15 1993-94, Efficiency Audit, The National Highway 'Lifeline of the Nation', was referred to the Committee by the House of Representatives on 13 December 1993.

CHAPTER 2
THE AUSTRALIAN ROAD SYSTEM

Introduction

2.1 The history of Australian roads can be divided into six stages, starting with the aboriginal pre-colonisation era which ended in 1788. The second phase coincided with the tenuous establishment of the new Colony and lasted from 1788 until 1810.[1]

2.2 Road transport probably began in Australia in 1805 with a three weekly wagon service between Sydney and Windsor. However, Australia's first significant road public transport occurred on the Sydney-Parramatta Road when a stage coach commenced operating on the route in 1818. Stage coach services began operating to Bathurst in 1824, the 220km trip taking four days.

2.3 In 1852 the US carrying firm of Wells and Fargo sent Freeman Cobb and three other employees to Australia to explore business opportunities. They began independent operations in 1853, first between Port Melbourne and Melbourne under the Wells Fargo banner and then, independently, transporting goods as Cobb and Co on rural operations from Melbourne to the Bendigo goldfields, using coaches built to Wells Fargo US designs.

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[1] The history of Australian roads in paragraphs 2.1-2.10 draws heavily from Lay M.G., History of Australian Roads, Australian Road Research Board, Special Report No 29.

2.4 Cobb and Co expanded interstate in 1861, with trips between Bendigo in Victoria and Bathurst in NSW and were operating to Sydney in 1862 and to Queensland by 1865. Indeed, WA was to be the only State where they did not operate. At its peak Cobb and Co controlled 10,000klm of mail coach routes, making it the world's largest coach system. For sixty years the firm played a major role in Australian transport, always moving beyond the expanding railways until its death knell was sounded by the simultaneous advent of motor trucks and mechanically skilled ex-soldiers returning from World War 1.

2.5 The third phase of road development was an expansory age which began with the arrival of Governor Macquarie and ended at mid-century with the simultaneous termination of convict labour, the discovery of gold and the introduction of the railway.

2.6 With the advent of a significant railway system in the 1860s, many roads were allowed to deteriorate. The pattern of improving a road, replacing it with a rail link and then letting the road fall into disrepair was to continue until the petrol driven motor car came to make its presence felt.

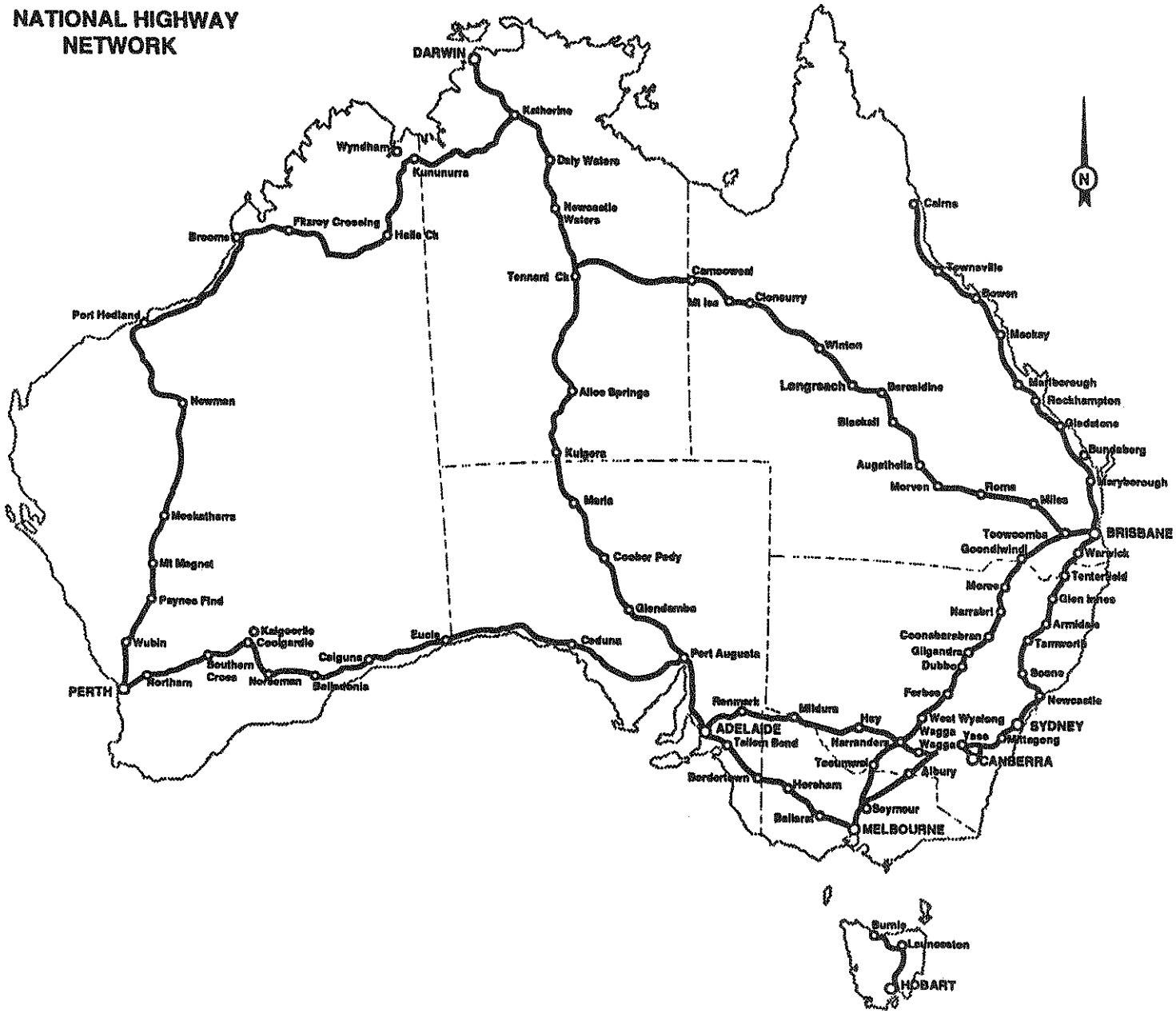
2.7 A major example of rail dominance was the closure of the main Sydney-Newcastle road in 1889. The importance of the railway was that it produced a new source of motive power, in many ways much superior to the horse and the ox. Train travel was not only cheaper; it was also safer and free from banditry and could operate in most weather conditions. It was to be half a century until the invention of the pneumatic tyre was to permit the road system to use a power source in any way matching that of the railway; with the exception, of course, of the tram.

2.8 One effect of rail dominance was that road construction was restricted to 'feeder' or access roads to rail stations and sidings and some urban road improvements. Stage coach operations were similarly forced to be feeder services.

2.9 The fifth stage ran to the early 1920s, depending on region, and was highlighted by the discovery of the usefulness of the car. The sixth and last stage is the age of the effective central road authority.

2.10 In Victoria in 1913, after sixty years of unco-ordinated activity and deliberate neglect under the decentralised control of the shires and after decades of lobbying, the Country Roads Board was formed to manage Victoria's roads. This same pattern of introducing a central road authority to co-ordinate the development of arterial roads to service inter-regional and interstate traffic was to be followed in all six States of the Commonwealth. By 1926 all States had established such authorities.

2.11 Each State established its own road classification system to meet the needs of the State as they saw it. The roads across Australia fall basically into two broad categories, arterial and local. The arterial roads include the principal routes (national highways) which link the State capitals and those joining the main centres of population within each State. Figure 2.1 shows a map of The National Highway System. Local roads are those joining farms and homes to the arterials or railheads, those servicing mines, forest and tourist areas as well as most streets in cities and towns.


NATIONAL HIGHWAY NETWORK
DARWIN
Katherine
Wyndham
Kununurra
Daly Waters
Newcastle Waters
Fitzroy Crossing
Broome
Halls Ck
Tennant Ck
Camooweal
Mt Isa
Cloncurry
Cairns
Townsville
Bowen
Mackay
Winton
Longreach
Barcaldine
Marlborough
Rockhampton
Gladstone
Blackall
Bundaberg
Hervey Bay
Augathella
Morven
Roma
Miles
Port Hedland
Newman
Alice Springs
Kulgera
Meekatharra
Mt Magnet
Marla
Coober Pedy
Toowoomba
BRISBANE
Goondiwindi
Warwick
Tenterfield
Glen Innes
Armidale
Tamworth
Narrabri
Moree
Coonabarabran
Gilgandra
Dubbo
Forbes
Scone
Newcastle
Peynes Find
Glendambo
Kalgoorlie
Coolgardie
Wubin
Eucla
Coduna
Port Augusta
Caiguna
Southern Cross
Norseman
Balmoonia
PERTH
Northam
Renmark
Mildura
Hay
West Wyalong
Wagga
Yass
Wollongong
SYDNEY
ADELAIDE
Tailem Bend
Harrandera
Wagga
CANBERRA
Tocumwal
Albury
Bordertown
Horsham
Seymour
Ballarat
MELBOURNE
Burnie
Launceston
HOBART
N

2.12 Local government authorities retained control of the local roads with the control of the arterial or main roads passing to the state road authorities. In 1974 the Commonwealth government assumed the financial responsibility for the funding and setting of standards for the national highways.

2.13 Table 2.1 gives road length by type. Details according to State are at Appendix 2.

2.14 A defining characteristic of the Australian road network is the comparison between the length of the road network and the number of cars which use it. Table 2.1 shows that Australia has a considerably larger length of road kilometres per 1000 passenger cars than other counties. This high ratio suggests that Australia faces a more difficult management task than most nations.

2.15 Paragraphs 2.15 to 2.20 contain brief descriptions of the various types of roads shown in Table 2.2.

2.16 State highways are the principal arteries for both interstate and intrastate connections, in many cases connecting with similar roads in other States, or linking the major population centres of a State or connecting ports with their hinterlands. They are the principal corridors for long distance travel.

TABLE 2.1 PUBLIC ROAD NETWORKS IN SELECTED COUNTRIES, 1984

	Kilometres of road per 1000 passenger cars[c]
Australia[d]	104
Federal Republic of Germany[f]	19
Great Britain	22
Japan	41
New Zealand	63
United States	49

Notes:

c. Including station wagons.

d. Excludes forest commission roads in Western Australia and Victoria and roads in towns and local government areas in the Northern Territory.

f. 1983 figure.

Source: Bureau of Transport and Communications Economics (1987), the Transport Sector in the Australian Economy.

2.17 Certain State highways are declared as national highways under Commonwealth legislation and are funded by the Commonwealth in consultation with the States. Other parts of State highways are funded by the States.

2.18 Main roads connect towns and closely settled areas with one another and with the highway system to form a network of important roads between the highways. They also serve as collectors for lesser rural roads.

TABLE 2.2

ROAD LENGTHS BY TYPE

TYPE OF ROAD	LENGTH (Km)	PERCENTAGE OF TOTAL
Highways	45,634	5.77
State arterials and main roads	77,045	9.75
Freeways	1,246	0.16
Toll roads	103	0.01
State Local, Secondary, tourist and development roads	30,596	3.87
Other State controlled	15,713	1.99
Local government urban	90,717	11.47
Local government rural	529,530	66.98
TOTAL	790,593	100.00

Source: Austroads - Road Facts - Unpublished

2.19 Freeways are roads generally having dual carriageways with no direct access from adjoining properties and side roads. All crossings of a freeway are by means of overpass or underpass bridges, and traffic enters or leaves the freeway carriageways by means of carefully designed connecting roads or ramps.

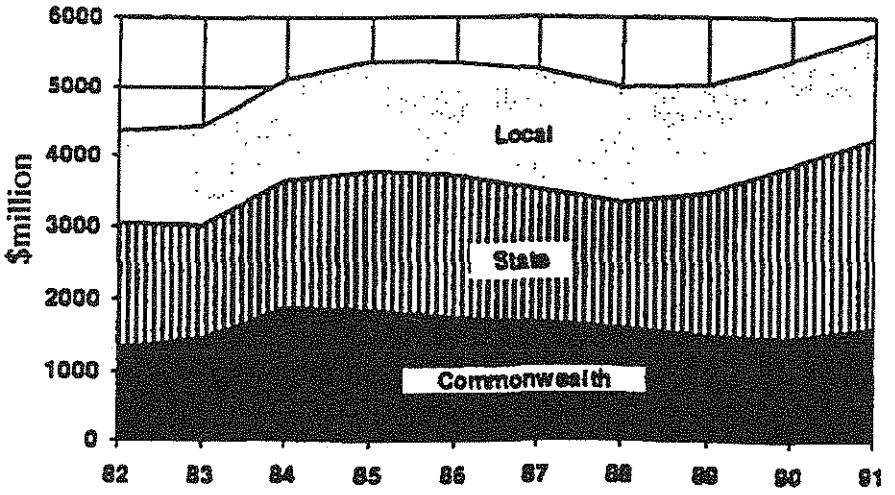
2.20 Toll roads are usually roads built to the standard of freeways where a toll applies. Toll roads may be operated by the state road authority or by private companies. Only New South Wales and Queensland have toll roads.

2.21 Secondary roads act as relief roads for neighbouring main roads or are the principal roads for local traffic in rural areas. They also serve as collectors for roads of lesser importance. Tourist roads serve the tourist industry by providing access to particular scenic and natural attractions. Developmental roads (Queensland) are the principal roads within large, less developed areas and provide connections between the highway system and large tracts of sparsely settled country.

CHAPTER 3
ROAD CONSTRUCTION AND FUNDING RESPONSIBILITIES FEDERAL, STATE AND LOCAL GOVERNMENTS.

3.1 Management of Australia's road network is a co-operative effort between the three levels of government - Federal, State and Local. Each of the three levels have for a number of years contributed about one third of the total expenditure on roads in each year.(DOTAC;1993) However as Fig 1 shows this has changed somewhat since 1989-1990. An increased proportion is now attributed to expenditure by State governments.

FIGURE 1 ROAD EXPENDITURE BY LEVEL OF GOVERNMENT (1990-91 PRICES)



Source: ABS Government Finance Statistics (GFS)

Commonwealth Government

3.2 The Commonwealth government has no constitutional responsibility for roads. It does, however, have responsibilities under S.51 (i) and (vi) for Trade and Commerce, and Defence powers which may impinge on roads. It also uses its powers under S.96 to make specific purpose payments for roads.

3.3 With the exception of roads on Commonwealth property and in its Territories, and in the past in the ACT and the NT, the Commonwealth has not been a road builder. However, because of its revenue raising capacity, the Commonwealth has chosen to provide financial assistance to the States and local government to help meet their road responsibilities.

3.4 Commonwealth road grants began in 1922. Over this time the roads grants program has gone through several transformations, combining different elements such as tied grants and matching requirements, in a series of packages, mostly in the form of Commonwealth State agreements (Painter and Dempsey;1992:55). Commonwealth road programs have ranged in breadth, emphasis and size relative to total roads funding.

3.5 Current Commonwealth government road funding is appropriated under the *Australian Land Transport Development (ALTD) Act 1988.* Originally this funding provided for four major categories; the national highway, state arterials, the 'Black Spots' program and Urban Public Transport (UPT) projects. Smaller outlays include payments for road

safety and land transport research and the repayment to the States and Territories of registration fees for interstate commercial vehicles under the Federal Interstate Registration Scheme.

3.6 The *ALTD Act 1988* has recently been amended to remove sunset clauses which would have ended the Act on 31 December 1993. The Government intends to introduce a new act in the 1994 Autumn sittings.

3.7 Commonwealth grants to the States for roads have been untied. From 1 January 1994 States will have responsibility for national arterial roads. Commonwealth funding of $350m per annum has been identified for this purpose, however, States have the discretion to use such funds for other purposes.

3.8 Commonwealth funding for local roads was untied with effect from 1 July 1992 and is paid through General Purpose Financial Assistance Grants and Identified Local Road Grants. While these funds continue to be identified as road grants they are not subject to any formal conditions requiring that they be spent for that purpose.

3.9 Table 3.1 outlines Governments' responsibility for roads.

State/Local Government

New South Wales

3.10 The Roads and Traffic Authority (RTA) is the government agency responsible for road construction and maintenance in New South Wales. The RTA was established by the *Transport Administration Act of 1988.*

3.11 The charter of the RTA is to manage the use, maintenance and enhancement of the State's roads and traffic system with emphasis on road safety and transport efficiency as part of an integrated and balanced transport strategy.

3.12 Under present legislation in New South Wales the RTA is responsible for the care and control of virtually all of the National Highway network throughout New South Wales, except for some short lengths through country towns. Local government has care and control of the vast majority of roads within the State, funded by both the RTA and council resources.

3.13 Local government has the care and control of some 98.5 per cent of the lengths of Local (Unclassified) Roads.

Victoria

3.14 Within Victoria, the State Government's responsibility for road construction and maintenance is discharged through the Roads Corporation of Victoria (VIC ROADS) which reports to the Minister for Transport. Local government operations come under the control of the Office of Local Government which reports to the Minister for Ethnic, Municipal and Community Affairs.

3.15 Within Victoria the declared network is classified into six categories. The Victorian State government is responsible for freeways, highways, main tourist and forestry roads. Local government is responsible for all unclassified roads. A largely completed review of road classifications was reported as ensuring that these responsibilities were appropriately assigned.

Queensland

3.16 The more important roads within the State, totalling about 33,775klm are declared under the Transport Infrastructure (Roads) Act 1991, and are the responsibility of the Queensland Department of Transport. The 134 local authorities and 31 aboriginal councils are responsible for the remainder.

3.17 The local authorities acting on behalf of Queensland Transport are the construction and maintenance authorities for a significant proportion of the declared road system. The following are the percentages for Queensland Transport's roadworks program carried out by day labour: road system upgrading 27 per cent and road system maintenance 50 per cent.

3.18 Local authorities were not required to make repayments on account of Queensland Transport's works carried out on declared roads after 1 July 1987.

South Australia

3.19 The role of the Department of Road Transport is changing from the responsibility for developing the arterial road network, to the overall management of the arterial road network and its use as an integral part of the transport system.

3.20 The Department of Road Transport's funding comes from both the Federal Government, principally through the Australian Land Transport Development (ALTD) program; and the South Australian State Government principally through fuel franchise, motor registration fees and drivers licence fees.

3.21 There is a clear demarcation of responsibility for the care control and management of roads according to category in South Australia. The State government is responsible for urban and rural arterial roads. Local government is responsible for all local roads.

Western Australia

3.22 The Main Roads Department of WA is responsible for the construction and maintenance of all highways and main roads in the State of Western Australia. The chief Executive Officer of the Department is the Commissioner of Main Roads. Under Section 15 of the *Main Roads Act 1930*, the Commissioner, 'shall have the care, control and management of the land over which a highway or main road is declared'.

Tasmania

3.23 From mid 1989 responsibilities for planning, design and project administration were allocated to the Department of Roads and Transport (DRT) whilst workforce construction and maintenance services were allocated to the Department of Construction (DOC).

3.24 Local roads are administered through 29 local government authorities. Recently an inquiry was undertaken into the organisation of local government which resulted in several amalgamations.

Northern Territory

3.25 The Department Of Transport and Works has the main responsibility for the provision and Maintenance of road transport infrastructure in the Northern Territory. The planning and investment functions are separated from the execution of construction and maintenance

Levels of expenditure

3.26 Details of the levels of road expenditure in actual dollars by different tiers of government from 1981-82 to 1991-92 are provided in Table 3.3.

3.27 In 1990-91, total real expenditure on roads by all levels of government increased by 7.4 per cent over the previous year's level. This followed increases in 1989-90 and 1988-89 of 5 per cent and 1.5 per cent respectively. Over this three year period, rising real levels of total expenditure on roads were attributed by the Bureau of Transport and Communications Economics to an increase in State government activity. In contrast, real levels of Commonwealth rose by an average of 3.5 per cent a year while local government expenditure fell by an average of 1.1 per cent a year over the same period.

3.28 Table 3.4 shows the breakdown of actual expenditures on roads by States and Territories from 1981-82 to 1990-91. In 1990-91 real spending increased by 23.5 per cent in New South Wales and 12.2 per cent in Queensland, with increases in these two States accounting for the bulk of the increase evident at the national level.

3.29 Information on the type of road program and dispersal of Commonwealth funds by category is given in Tables 3.4 and 3.5.

3.30 Table 3.6 contains information on the percentages of State roadwork programs undertaken by each industry sector.

TABLE 3.1 GOVERNMENT RESPONSIBILITY FOR ROADS KILOMETRES

Jurisdiction Level	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	Total
Federal(NH)	3028	974	4121	2731	4634	322	2670	0	18479
State/ Territory[a]	36322	21772	29729	20153	19596	3272	18552	2470	151867
Local Gov't[b]	141323	138039	135665	72090	118820	12954	1356	[c]	620247
Totals	180673	160785	169515	94974	143050	16548	22578[d]	2470	790593[e]

Notes:

a In some cases State/Territory funded roads are managed through Local Government

b Local Government data is correct as at June 1991. Other data is dated March 1993

c The ACT covers local authority roles as well as State/Territory roles. Of the 2740 km of roads, about 1850 km are municipal class roads.

d Northern Territory figures do not include Aboriginal access roads (about 8000 km) which require a permit to use. These roads are managed by the Northern Territory Government.

e The total differs from that given in ABS sources (about 810 000 km). The difference could be attributed to such factors as:

i transfers of some road sections from State control to Local government between June 1991 and March 1993 and,

ii some roads not controlled by road authorities in the three levels of government (eg some forestry roads) are not included in the above figures.

Source: Austroads Road Facts unpublished

TABLE 3.2 ROAD EXPENDITURE BY LEVEL OF GOVERNMENT $m Actual Expenditure

Government	81-82	82-83	83-84	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92
Federal[a]	718.4	895.3	1221.5	1273.9	1284.1	1289.6	1294.0	1302.4	1352.3	1586.7	1368.0
State[b]	960.5	984.9	1177.2	1354.3	1511.6	1486.2	1452.4	1835.4	2237.5	2656.2	na
Local	713.8	872.1	962.1	1108.3	1210.1	1331.9	1361.2	1366.8	1418.1	1522.0	na
TOTAL	2392.7	2752.3	3360.8	3736.5	4005.8	4107.6	4107.6	4504.6	5007.9	5764.9	na
ROAD COST DEFLATOR[c]	54.5	61.4	65.3	69.0	74.1	77.5	81.9	87.9	93.3	100.0	102.9

Notes:

na not available.

a. Includes ACT expenditure up to 1 January 1989; level for 1991-92 sourced from 1992-93 Commonwealth Budget.

b. Some earlier year figures differ from those published in Transport and Communications indicators due to revisions by the ABS.

c. The BTCE Road Construction Price Index, as given in BTCE (1P 32), and updated to 1991-92.

Source: ABS; Government Finance Statistics, unpublished extract; BTCE (1P 32), Road Construction Price Indexes, 1977-78 to 1987-88, Information Paper 32, AGPS, Canberra; 1992-93 Commonwealth Budget Statements.

TABLE 3.3 TOTAL ROAD EXPENDITURE IN STATES/TERRITORIES $m Actual Expenditure

STATE/ TERRITORY	81-82	82-83	83-84	84-85	85-86	86-87	87-88	88-89	89-90	90-91
NSW	873.0	993.6	1217.2	1380.9	1456.5	1518.3	1538.2	1618.9	1873.0	2479.6
VIC	480.6	552.9	721.3	734.7	827.4	839.8	834.7	910.6	951.4	890.6
QLD	446.5	526.4	641.5	745.0	798.2	811.7	821.1	864.5	976.6	1174.8
WA	231.2	274.4	318.0	353.4	372.7	384.9	386.6	427.1	474.5	491.1
SA	177.9	203.8	233.2	261.5	285.0	281.8	285.3	315.7	335.4	358.3
TAS	95.3	110.1	119.6	131.3	141.3	137.8	139.7	153.0	162.4	146.6
NT	68.0	62.9	87.2	101.6	88.8	88.8	82.7	131.7	105.4	104.7
ACT[a]	18.9	27.2	20.3	26.6	33.2	41.8	45.1	80.9	125.7	116.2
TOTAL	2392.7	2752.3	3360.8	3736.5	4005.8	4107.6	4136.2	4504.6	5007.9	5764.8
ROAD COST DEFLATOR[b]	54.5	61.4	65.3	69.0	74.1	77.5	81.9	87.9	93.3	100.0

Notes:

a. Commonwealth territories road expenditure is included in ACT road expenditure.

b. The BTCE Road Construction Price Index, as given in BTCE (1P 32), and updates.

Source: ABS; Government Finance Statistics, unpublished extrcts, BTCE, Road Construction Price Index, 1977-78 to 1987-88, Information Paper 32, AGPS; BTCE estimates.

TABLE 3.4 COMMONWEALTH ROAD EXPENDITURE BY PROGRAM $m Actural Expenditure

ITEM	82-83	83-84	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92	92-93[a]
ROAD PROGRAM DISTRIBUTION Grants											
Road Grants Act 1981	734.0	778.0	825.0								
Australian Land Transport Program	..	..	..	805.1	805.4	764.3	425.0	..	..	..	..
Australian Bicentennial Road Development	117.0	417.2	417.2	440.0	439.6	480.2	272.9	..	..	..	..
Australian Centennial Road Development	..	..	..	..	..	..	525.7	1335.0	..	..	..
Australian Land Transport Development	..	..	..	..	..	..	..	..	1469	1186.8	1534.7
Federal Interstate Registration Scheme	..	..	..	..	1.4	4.2	10.8	17.1	14.6	15.9	17.1
Black Spot Program	..	..	..	..	..	..	..	..	50	60.0	130.0
Other[b]	44.3	26.3	31.7	39.0	43.2	45.3	68.0	0.2	53.1	105.3	104.2
TOTAL OUTLAYS[c]	895.3	1221.5	1273.9	1284.1	1289.6	1294.0	1302.4	1352.3	1586.7	1368.0	1786.0

Notes:

.. Not applicable

a. Budget estimates

b. Balancing item, includes sundry expenditures such as ACT roads expenditure and road safety research

c. Total Outlays from 1982-83 to 1990-91 sourced from ABS, Government Finance Statistics, while 1991-92 and 1992-93 sourced from 1992-93 Budget Statements. Excludes the roads works component of special programs, eg the steel Cities Program, as well as local roads component. Totals for 1991-92 nd 1992-93 excludes local roads component.

Source: ABS, Government Finance Statistics, unpublished extracts; ATCE, Road Construction Price Indexes 1977-78 to 1987-88; DOTAC, Annual Report.

TABLE 3.5 COMMONWEALTH ROAD EXPENDITURE BY ROAD CATEGORY $m Actual Expenditure

ITEM	82-83	83-84	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92	92-93[a]
ROAD CATEGORY DISTRUBUTION											
National roads	386.0	518.6	542.4	559.2	577.9	549.2	473.5	521.2	554.2	656.9	881.5
Arterial roads	295.0	444.3	417.3	448.7	433.6	456.5	461.3	510.6	503.4	435.4	572.8
Local roads [d]	189.6	252.6	256.5	272.9	271.3	268.0	275.1	303.1	323.8	..	..
Unallocated[e]	24.7	6.0	3.7	3.3	6.8	20.3	92.5	17.4	205.3	275.7	331.7
TOTAL OUTLAYS[c]	895.3	1221.5	1273.9	1284.1	1289.6	1294.0	1302.4	1352.3	1586.7	1368.0	1786.0
ROAD COST DEFLATOR[f]	61.4	65.3	69.0	74.1	77.5	81.9	87.9	93.3	100.0	102.9	na

Notes:

c. Total Outlays from 1982-83 to 1990-91 sourced from ABS, Government Finance Statistics, while 1991-92 and 1992-93 sourced from 1992-93 Budget Statements. Excludes the roads works component of special programs, eg the steel Cities Program, as well as local roads component.Totals for 1991-92 nd 1992-93 excludes local roads component

d. From 1991-92 onwards, amounts equivalent ot local roads funding are being provided via general purpose assistance for local government and general revenue assistance to the States. In 1991-92 and 1992-93 these amounted to $303.2m and $321.2m respectively.

e. Includes Federal Interstate Registration Scheme expenditire and sundry expenditure such as road safety, Commonwealth territories road expenditure and expenditure in 1990-91, 1991-92 nad 1992-93 for programs such as 'Black Spot', 'Provincial Cities' and rural highways programs.

f. The BTCE Road Construction Price Index, as given in BTCE (IP 31) and updated. This may be used to convert actual expenditure into real or constant price levels.

Source: ABS, Goverment Finance Statistics, unpublished extracts; BTCE, Road Construction Price Indexes 1977-78 to 1987-88; DOTAC, Annual Report.

TABLE 3.6 SECTOR SHARES OF ROAD PROGRAM BY COMPONENTS: FOR EACH STATE (1990-91)

State	Program Class	% age of Expenditure by State			Total
		SRA Own Workforce	Private Contract	Local Authorities as SRA Agent	
NSW	Capital/Rehab Works	27	27	8	62
	Major Periodic Mtce	7	1	4	12
	Routine Mtce	17	0	9	*26*
		51	28	21	100
VIC	Capital/Rehab Works	8	38	30	76
	Major Periodic Mtce	3		3	6
	Routine Mtce	11		6	17
		22	38	39	99
QLD	Capital/Rehab Works	19*	28	18	65
	Major Periodic Mtce	6*		6	12
	Routine Mtce	12		11	23
		37	28	35	100
SA	Capital/Rehab Works	26.6	19	1.4	47.0
	Major Periodic Mtce	9.5	8.8		18.3
	Routine Mtce	32.4	1.3	1	34.7
		68.5	29.1	2.4	100
WA	Capital/Rehab Works	24.5	29.8	1.3	55.6
	Major Periodic Mtce	19.5	0.2	1.7	25.0
	Routine Mtce	19.1		0.3	19.4
		63.1	33.6	3.3	100
TAS	Capital/Rehab Works	51.3	11.8	0.1	63.2
	Major Periodic Mtce	9.0	0.2		9.2
	Routine Mtce	27.1		0.5	27.6
		87.4	12	0.6	100
NT	Capital/Rehab Works	2	55		57
	Major Periodic Mtce	1	10		11
	Routine Mtce	3	29		32
		6	94	0	100

Note: * These figures include a private sector sub-contract element

Source: Submission 65 Queensland Department of Transport

CHAPTER 4
STRATEGIC MANAGEMENT OF THE ROAD NETWORK

The need for program objectives

4.1 Managing for results is becoming embedded as part of the public sector culture. A prerequisite of managing for results is the requirement for clearly articulated program objectives.

4.2 It was put to the Committee that the lack of clear objectives for the road network has resulted in ineffective and inefficient road construction and maintenance (Submission 39:2, Submission 57:2,3). The absence of any clearly defined objectives for the road network has resulted in a focus more on how the road system is constructed and maintained rather than on establishing a strategic management system for the road network (Submission 57:2).

4.3 The Committee believes that a set of clear, unambiguous objectives is an essential ingredient in developing an effective strategic plan for a road network. Obviously, individual road networks will have different objectives which reflect different operating requirements and conditions.

4.4 It is important that objectives for the road system be clearly set out for several reasons. First, clearly defined objectives enable a strategic outlook for the road system to be developed. In the past, road funding has been input driven not strategically focused (Transcript:799). Essentially, road

authorities have, in the past, been more concerned with the allocation of road funding they receive, rather than in using what is allocated to them efficiently.

4.5 Of major concern in this area is the relationship between the Commonwealth and State governments and local councils. The Australian National Audit Office (ANA) points out that a lack of clear objectives for each level of government causes confusion and may result in each level of government pursuing different objectives (Audit Report No.6 1993-94:5). The Committee believes that there is great potential for possible improvements in efficiency to disappear down the cracks between the levels of government.

4.6 Second, clearly set out objectives enable governments to enhance the effectiveness of road network planning through establishing priorities for road construction and maintenance projects. There may be several considerations in setting priorities for projects, such as economic importance of the road or proposed new construction, current condition of road surface or access and equity factors (Transcript:203). For example, the South Australian Department of Road Transport suggests that priorities should be based on the level of performance desired from the road system (Submission 57:10). The establishment of priorities for the road network is an integral step in achieving allocative efficiency.

4.7 What criteria are used to rank priorities is not the central issue. The point is that without clear, unambiguous objectives there will be no

criteria with which to consistently and fairly rank road construction and maintenance projects; for example, between arterial and local roads and between new and maintenance work.

4.8 Third, clear objectives are important from the point of view that without clearly defined expectations it is impossible to make an assessment on the effectiveness of a program. The Auditor-General says, 'Performance evaluation without clear objectives is not possible' (Australian National Audit Office;1993:5).

4.9 Fourth, objectives, if they are not clearly set out, may change incrementally over time as they are redefined to accommodate alterations or fluctuations in funding levels, resulting in the original objectives not being achieved.

4.10 The bottom line with the need to establish objectives to enable the development of a strategic outlook for a road network is that it maximises the effectiveness of the program. It ensures that the right road, is built to the right specifications, in the right place, at the right time, for the right reasons.

4.11 The Department of Transport and Communications in its submission to the inquiry suggests that successive federal governments have taken the view that the interstate network is to serve national objectives, but fails to outline these objectives (Submission 56:10). The Commonwealth Government, in its 'Australia's Land Transport Strategy' paper, undertook to establish stated objectives for the National Highway System (1993:7).

4.12 The draft National Highway bill circulated by the Minister for Transport and Communications sets out objectives for the National Highway. Briefly, these objectives encompass the facilitation of trade, access to major population areas, efficient planning and design, ecologically sustainable development and management and administrative practices (Exhibit 12:5).

4.13 It has been suggested to the Committee that benefits of approximately 20 per cent are available through more strategic management (Transcript:804,737). Considering that the federal road construction and maintenance program costs the Commonwealth over $800m a year, there are significant savings to be made, and the absence of clearly articulated program objectives is a serious omission. Undoubtedly, a much greater dividend is available from the remaining $5.8b expended annually on roads if States governments and councils had strategic management systems for their road networks.

4.14 To this end the Committee is concerned that State governments and councils may fail to outline clear objectives for their road networks. While these levels of government may have technical objectives there appears to be a lack of strategic outlook in some cases. This situation is changing, for example, Queensland has set out clear objectives for trade, economic and regional development (Transcript:799).

4.15 The Minister for Transport and Communications has acknowledged the need for strategic management of the National Highway System (NHS) in the proposals for the future administration of the NHS.

The Minister proposes that works programs will be indicated far enough ahead to allow for proper planning by industry and government (Exhibit 12).

4.16 An examination of the annual reports of State road authorities revealed that all had a set of objectives for their road networks. While some of these were very good, some of the stated objectives were very general. Also, in some cases it was unclear whether the stated objectives actually translated into a strategic outlook for the road network.

4.17 The Committee has been unable to establish whether councils set objectives for their road networks. Given the size of the local government road task it is imperative that local councils do adopt a strategic approach to the management of their road networks. The Committee recommends that:

1. **The Minister for Housing, Local Government and Community Services require the preparation of a strategic plan, by Councils, for the management of local roads as a condition of federal road funding.**

4.18 The Committee recognises the benefits to be gained from effective strategic management of road networks, and believes that all levels of government would gain substantial improvements in efficiency by reviewing their objectives and adopting a strategic plan for their road networks.

4.19 In view of the comments made by the Australian National Audit Office in its 1993 Efficiency Audit Report of the Department of Transport and Communications and Administration of the National Highway System, the Committee will make further and final comments on objectives in its review of that report.

Performance indicators

4.20 Performance indicators should flow out of clearly articulated objectives and strategies to achieve these objectives. To do otherwise is to put the cart of performance indicators before the horse of program objectives. Unfortunately, in some cases this is the state of road programs in Australia.

4.21 Some State road authorities have performance indicators in place. For example, Queensland and Victoria have established a system of performance indicators to measure both the efficiency and effectiveness of roads programs (Submission 70:21, Transcript:834).

4.22 The Committee is aware that AUSTROADS is currently conducting a project to establish performance indicators for the road network. The AUSTROADS performance indicators will measure accountability and efficiency of SRAs asset management strategy and road safety improvement (Project BS.3.F.48). A second AUSTROADS project will develop objectives and roles for the road network (Project RSM.3.A.16).

4.23 The two AUSTROADS' research projects are closely related. The establishment of clearly set out objectives which is being undertaken in one project is absolutely essential for the development and refinement of meaningful performance indicators which are being developed in the other. A combination of the projects will provide a framework for evaluating the performance of Australia's road network.

4.24 The performance indicators being developed by AUSTROADS are designed to allow for valid comparisons to be made between the States. The ability to compare performance indicators enables SRAs to make an assessment of the efficiency and effectiveness of their operations in respect to what other States are achieving.

4.25 States are responsible for monitoring the conditions of roads in their jurisdictions. To date, however, no comprehensive comparisons between the States or international best practice have been made (Submission 71:18,73:1). Achieving agreement between the States over what performance indicators should be utilised and how they are to be measured has been difficult. Several State authorities have argued that comparisons are not valid because of different geographic, geophysical or weather conditions (Submission 71:18, Submission 70:21).

4.26 Comparisons can be misleading and care needs to be taken to ensure that comparisons are meaningful (Submission 70:21). For example, accounting methods may vary between jurisdictions, resulting in inaccurate and misleading comparisons being made. The Committee believes that despite the difficulties, and to ensure its usefulness data collected from road authorities in developing performance indicators should be comparable.

4.27 Obviously, indicators that usefully measure performance can be the amber lights that trigger evaluations of why efficiency is not as high as it might be. The AUSTROADS indicators do this. Some of them, for example, those on the conditions of roads and bridges are important in arresting the deterioration of a multi-billion dollar asset. Others feeds directly into the efficiency of road construction and maintenance.

4.28 AUSTROADS expects the performance indicators to be fully developed and operational by July 1994.

4.29 The Committee believes that the setting of objectives, development of strategies and the measurement of progress is essential to improve the efficiency and effectiveness of road construction and maintenance. The measurement of progress by the development of performance indicators is especially important because it enables effective evaluation of road programs.

4.30 Notwithstanding the wide divergence in Commonwealth, State and local road programs the Committee has chosen not to make specific recommendations regarding performance indicators. However, the Committee considers that all road authorities will gain efficiency benefits from the implementation of comprehensive and effective sets of performance indicators.

CHAPTER 5
INSTITUTIONAL ARRANGEMENTS

5.1 Institutional arrangements intimately impact on the efficiency and effectiveness of road construction and maintenance as they affect the ability of road authorities to optimise benefits from available resources. The Committee believes that improvements to the institutional arrangements between levels of government will result in improvements in the efficiency and effectiveness of road construction and maintenance.

This chapter will examine issues associated with road funding and administrative arrangements between the Commonwealth and States, local government funding and administrative arrangements and a new national roads body.

Road funding (Commonwealth/State)

5.2 Federal Government funding for roads is administered under the *Australian Land Transport Development Act 1988* (ALTD). Details of the Act are contained in paragraphs 3.5-3.7.

5.3 Currently, there is a five year rolling program for Commonwealth funded road expenditure. However, this is only notional as actual commitments are made annually, with indications of funding levels based on project approvals. The five year plan is intended to allow the States some ability to develop longer term plans based on indicative funding levels (Submission 56:7).

5.4 Construction and maintenance funding is identified separately. Project approvals for construction proceed through a three stage process. Stage 1 is a Forward Strategy Report which outlines the nature of the project and expected costs. Forward Strategy Reports are planning documents only and do not commit the federal government to funding a project.

5.5 Stage 2 requires a State to submit a Project Proposal Report which sets out details of the project. Federal ministerial approval at this stage commits the Federal Government to funding the project.

5.6 Stage 3 is actual construction and commits the federal government to funding the total estimated cost of the project. The total estimated cost is an agreed figure. There is a 10 per cent contingency provision to cover the costs of projects which run over cost. If a project exceeds a 10 per cent cost overrun then the balance must be met by the State or Territory road authority.

5.7 Minor works and maintenance on the national highway are funded in bulk on the basis of administrative links. There are 52 such links on the National Highway each of which is generally homogeneous in terms of traffic, terrain and climate (Submission 56:6). The links are the basis on which the SRAs report on the condition of the national highway. The State road authorities (SRA) collect Pavement Management System (PMS) data on the links and this information is used to determine funding levels (Submission 88:5).

5.8 On the basis of the evidence received by the Committee there are two fundamental issues concerning the current road funding system which affect the efficiency and effectiveness of road construction and maintenance. These are:

- unpredictability of funding arrangements and lack of long term funding programs; and
- the annual budget cycle.

Unpredictability of funding

5.9 All State road transport authorities considered the current funding system to be inappropriate for one principal reason, that road funding fluctuates to the extent where long term planning may not be possible. Long term planning enables States to obtain the necessary land purchasing and environmental clearances for road construction, allows for comprehensive and proper tendering processes to be undertaken and makes for improved investment decisions (Submission Nos 57:7, 71:21, 69:39). Local government also finds uncertainty of funding a problem, particularly in relation to maintenance (Submission 81:5).

5.10 Typical concerns over short term increases and decreases in funding were expressed by the NSW Roads and Traffic Authority (RTA). Problems arising when funds are increased at short notice include:

- insufficient lead times to ensure that appropriate planning decisions are taken;

- an inability to alter programs at the strategic level resulting in the inefficient expenditure of funds;
- an unnecessary level of administrative overheads; and
- increased project costs because of compressed construction times.

5.11 Problems arising from short notice of funding cuts include:

- an inability to maintain the asset in line with long term demand;
- inadequate time for maintenance strategies to adjust; and
- unfinished projects or 'missing' links and because contracting locks in construction funding, any reductions in funding usually affect maintenance, impacting upon asset preservation and increasing life cycle costs of the assets. (Submission 69:40)

5.12 Other State authorities had similar problems as the RTA (Submission 71:6,70:9,82:3,86:3). The essential problem is a lack of opportunity for SRAs to plan long term with certainty.

5.13 Another issue with fluctuating funding is the undermining of confidence in the private sector. The NRMA (Submission 64:3) asserts that *more predictable funding levels would give the private sector more* confidence to tender for projects, resulting in more efficient road construction. A major contractor, John Holland, agrees with the NRMA suggesting that more certain levels of funding would enable contractors to invest in major pieces of construction equipment (Transcript:388).

5.14 Problems associated with the utilisation of equipment by private contractors may be as much a case of oversupply as a case of unpredictability of funding. On several occasions the Committee received anecdotal evidence that in populated areas there were more contractors and equipment than could be gainfully employed on road works. This may be a case where excessive competition adds to inefficiency.

5.15 The fundamental issue about uncertainty of funding is whether road management is to be driven by funding or considerations of efficiency and effectiveness. Fluctuation and unpredictability in funding, by their very nature, make the planning process reactive and management strategies become funding dependant, reducing the road management process to a manipulation of the roads budget to deliver a redefined level of service. (Submission 87: Section 8:12)

5.16 The Committee believes that there are real benefits to be gained from greater certainty in road funding allocations. The Committee notes that in a proposal on the future of the National Highway System the Minister for Transport and Communications has indicated that funding levels for the National Highway will be set for a period of three years in advance (Exhibit 12). It is planned to make a special appropriation of $2.64b (1994-95 dollars) for the first three years and to maintain a three year funding program by annual supplementation.

5.17 The Minister for Transport and Communications states this has been done, 'to allow proper forward planning by industry and Governments' (Exhibit 12:3). The Minister goes on to say:

> The objective of this move is to provide more predictability and certainty to ensure a more effective matching of project approval and construction timetables. (Exhibit 12:3)

5.18 The Committee endorses this proposal as it goes a significant distance in addressing problems associated with funding fluctuations. The Committee understands that the 5 year indicative funding levels will be maintained in association with the three year plan.

5.19 The Committee recommends that:

2. **The Commonwealth Government maintain a guaranteed three year funding timeframe for the National Highway System.**

5.20 The Committee is concerned that the most recent funding arrangements between the Commonwealth, States government and councils will increase the unpredictability of road funding. With the exception of the National Highway, funding provided by the Commonwealth will not be earmarked exclusively for road works. The States have been accused of diverting to non road uses money which previously would have been earmarked for roads (NRMA;1993:16).

5.21 The Committee recognises that at the July 1991 Special Premiers Conference governments determined specific road responsibilities. Nevertheless, the diversion of previously specified funds for roads to other purposes reduces the overall road effort.

5.22 The Committee believes that money provided by the Commonwealth which is intended for roads should be spent on roads. It is essential that State and local governments be accountable for the expenditure of funds provided by the Commonwealth government for roads. The Committee notes that local government is required to report on local government roads expenditure to the National Road Transport Commission.

5.23 Currently, State road authorities and councils have freedom to decide which roadworks are performed with federally sourced funds intended for roads. However, they should not be able to divert federal funds to other areas of expenditure. The Committee recommends that:

3. **Commonwealth road funding to State governments and Councils continue to be earmarked and State Governments and Councils be required to verify annually that such funds have been expended on roadworks.**

The budget cycle

5.24 The annual budget cycle poses two problems for the effective and efficient use of road funding. They are the annual rush to complete expenditure prior to the end of the financial year and the difficulties in the coordination of suitable construction times at certain periods during the year with available funding.

5.25 The rush to spend money on a number of road projects by the end of the financial year causes several inefficiencies. Delays in providing funding result in a rush of spending on road works. Consequently, a sudden glut of tenders in a short period leads to higher tender prices.

5.26 The desire to spend money prior to the 30 June cut off may result in lesser priority roadworks being undertaken, for example, line marking or other minor works (Submission 87:3). This problem can also cause projects to be undertaken in smaller lots which reduces efficiency (Submission 70:25). An additional problem is that when funds are stopped on 30 June projects may be delayed and unspent funds are considered in the next years allocation, resulting in a reduction in funding (Transcript:736).

5.27 The problem with the budget cycle, in respect of scheduling optimal construction periods, is its timing during the year. As the budget is presented in August, road funding levels may not be confirmed until later in the year, especially if there are parliamentary delays (Submission 82:3,87:4, Transcript:478). The current budget cycle conflicts with optimal construction times in certain parts of Australia. For example, in northern Australia this budget cycle timing results in construction being ready to commence at the start of the wet season so that projects have to be delayed or become more expensive (Transcript:476).

5.28 The Committee understands that the Department of Transport and Communications has altered the payment system for road funding to take account of seasonal variations in the level of work. States are able to adjust payments so that certain times of the year are more heavily funded

than others (Transcript:672,674,675). For example, it would be possible to increase funding for northern Australia during the dry season and reduce funding during the wet.

5.29 The 1994 Budget will be presented next May and is expected to be passed by 30 June. The Committee views the Commonwealth Government's initiative to bring the introduction of the Budget forward and its earlier passage as a positive step in removing the detrimental effects of the fiscal cycle on road construction and maintenance.

5.30 The Committee believes that road authorities should be able to spend their allocated amount of funding, regardless of whether funding is expended in the designated financial year. To avoid the problems of funding and funding extending past the end of a financial year the Committee recommends that:

4. a) **Trust funds be established into which road funds intended for allocation to State Road Authorities and Councils shall be deposited.**

b) **State Road Authorities and Councils have access to such funds for one year from the date of deposit.**

Administrative arrangements

5.31 The relationship between the Commonwealth and State governments is the area of most concern in regard to administrative arrangements. This relationship is managed according to the Notes On

Administration developed by the Department of Transport and Communications.

5.32 Administrative requirements are principally in place to ensure accountability in road funding programs and that the Commonwealth government has adequate control over the expenditure of its funds by State and local governments (Submission 88:6-9).

5.33 In the past, administrative requirements, particularly by the Commonwealth, were increasing. The Queensland Department of Transport suggests that:

> ... it would be fair to say that each new Federal Road Funding Act promised less but resulted in more Federal involvement in the details of Federal road program formulation, project approval and program implementation.

5.34 Administrative arrangements associated with the current ALTD program do impose a cost on SRAs while not adding value to road programs. The Committee accepts that increased administrative arrangements may impose a cost on State authorities, however these costs were unable to be quantified (Transcript:750). It is claimed that the principle reason for administrative cost is the duplication of administrative function (Submission 57:8).

5.35 The Committee accepts that administrative requirements may be excessive and that they may not add value. At the same time, however, it is concerned that administrative requirements and costs do not become a more

important consideration than the implementation of adequate and proper administrative procedures which ensure accountability in road funding programs.

5.36 Another more identifiable aspect of administrative arrangements which affects efficiency is the project based approach to National Highway funding (Paragraph 5.4-5.7). Main Roads Western Australia suggests that the timing of project approval is a problem (Transcript:476). If approval is delayed, particularly at the final stage, a project can be pushed into the wrong time of the year for construction. It is suggested that delays in project approval can be up to four or five months (Transcript:380). This may result in increased costs of construction or the project being delayed. Additionally, the project may have to be undertaken in smaller, less efficient lots.

5.37 In the past, administrative requirements were a problem (Submission 88:6). However, steps have been taken by the Department of Transport and Communications to reduce the amount of paperwork which is required (Transcript:680,681).

5.38 Improvements have been made to the NHS administrative processes. As a result of the streamlining of the project approval process for the NHS the size of projects has increased and the number of projects has decreased (Submission 88:6).

5.39 In the Proposals for the Future Administration of the National Highway System it is proposed that National Highway funding will remain

on a project basis (Exhibit 12). However, there are changes contained in the proposal which the Committee feels will ameliorate the problems associated with project based approvals.

5.40 The combination of the proposed introduction of a three year National Highway System Strategic Plan, which will determine the works program for a three year period, and the proposed move to three year guaranteed funding appears to remove much of the risk in developing and implementing projects (Exhibit 12).

5.41 The Committee believes that it would be beneficial to the effectiveness and efficiency of the entire road system if State, Territory and local governments were to introduce, into their own road systems, similar three year planning and funding programs as proposed by the Commonwealth government.

Alternative funding

5.42 In its Discussion Paper the Committee raised the issue of alternative sources of road funding. The Committee sought views on the feasibility of toll roads and shadow tolls. There was general agreement that toll roads were acceptable, with several qualifications.

5.43 There are two main benefits associated with toll roads. First, the community may be provided with better roads sooner. Second, the construction of toll roads should reduce traffic levels on existing local roads (Submission 86:7.2).

5.44 It was suggested that to be commercially viable toll road projects needed substantial traffic levels (Submission Nos 68:6, 69:28, 80). The only operating toll roads are in high traffic density areas of NSW and Queensland. Conversely, the South Australian Department of Road Transport makes the point that South Australia does not have the traffic volumes to justify toll roads (Submission 57:6). Also, the Department of Transport and Communications makes a similar point about the National Highway which is predominantly a rural road (Submission 56:16).

5.45 It was put to the Committee that investment in toll roads should only be considered when they can be commercially justified (Submission 60:6). It was further suggested that toll road operations should not involve government money (Submission 60:6, 86:7.1). As toll collection adds to the cost of operating a road it was suggested to the Committee that if government money is available to finance a project then it should be funded by public money rather than the private sector (Submission 68:6).

5.46 Equity and access problems were raised. The NRMA argues that where toll roads are built there should be a free alternative route (Submission 64:8). It was suggested that the construction of toll roads should be a last resort and should not override the construction of publicly funded roads (Submission 64:8).

5.47 On the evidence received the Committee believes that private investment in roads is warranted. However, careful consideration should be given to the economic viability of the project as there should be no risk to public funds. Equity and access issues must also be factored into decisions on toll road options.

5.48 The Commonwealth Government has recently made changes to taxation provisions to encourage private investment in infrastructure (Submission 46). These changes include the introduction of infrastructure bonds and a development allowance. Previously non-deductible assets will now be able to be depreciated and accelerated depreciation will be allowed on some plant and equipment (Submission 46:1,2,3). The exact impact of these measures on increasing private investment in roads is unclear. However, the Committee welcomes their introduction and encourages private enterprises to take advantage of the benefits they offer.

5.49 The Committee received little hard information on all aspects of the construction and operation of the toll roads. To improve the amount and quality of information available, on which to base decisions regarding toll road investments, the Committee recommends that:

5. **The Bureau of Transport and Communications Economics prepare a guideline paper on the viability, construction, operation and equity of toll roads.**

Local Government

5.50 At the outset it should be made clear that the wide diversity between councils makes it difficult for generalisations to be made about local government. It is obvious that the priorities and methods of operation of a remote rural council and a densely populated inner urban council will differ significantly. However, the Committee believes that regardless of

differing geographic location, population density, operating methods and weather conditions, there are aspects of council management practices which are common and in need of improvement.

5.51 The Committee has received little evidence concerning the road funding or administrative arrangements of local councils. Local government accounts for more than 26 per cent of road expenditure and is responsible for much construction and maintenance on behalf of SRAs. The evidence the Committee has received, suggests that while there are several problems with local councils' involvement in the administration of the road construction and maintenance process, it is equally evident that, generally, there is a good working relationship between most councils and State governments (Submission 71:20,71:26,87:6).

5.52 VICROADS suggests the small size of some local councils may result in a 'localised attitude' which impedes the effectiveness of longer term planning as the focus is on specific local concerns rather than on overall strategy (Submission 70:25).

5.53 As local councils are now funded by direct grant from the federal government, there are concerns that what has previously been dedicated road funding to other purposes (Transcript:206,207). The Committee has received no evidence that this is the case.

5.54 The Australian Local Government Association (ALGA) suggests that the relationship between local government and the States is improving (Submission 81:2). The ALGA makes the point that central agencies are inefficient when making local decisions and that decisions should be made

locally (Submission 81:3). Local councils are concerned with getting the best value for each road dollar and welcome the increasing concern with improving the effectiveness and efficiency of road construction (Submission 81:2,3).

5.55 Some councils are concerned that road funding has been untied (Submission 81:1). Remote councils are concerned that if economic analysis is the only consideration for the distribution of road funds they will suffer a reduction in funding. This is a complicated area and the Committee believes that this report is not the place for a detailed discussion of the issues. Suffice to say that considerations other than economic should be used in determining the distribution of road funds between councils.

5.56 The Committee is concerned about the paucity of information on the operations of councils road programs. The inquiry has been unable to establish the basis on how councils set priorities for road projects and how efficiently road projects are carried out by councils. More information on the effectiveness and efficiency of local government in road construction and maintenance should be available.

5.57 Currently, there is a joint AUSTROADS and ALGA project, the Local Roads Expenditure Summary, which is developing a common road expenditure reporting system which will for the first time provide information for councils to determine their road need and expenditure priorities. This project will provide a means for the monitoring of the performance and condition of the local road system (Submission 81:7). This

annual information, in future years, will be an effective means of monitoring the roads performance of individual councils. Templates used in the study are at Appendix 3.

5.58 Accordingly, the Committee recommends that:

6. a) **The Minister for Housing, Local Government and Community Services table the results of the Local Roads Expenditure Summary project in Federal Parliament.**

b) **The Minister for Housing, Local Government and Community Services liaise with the Australian Local Government Association to initiate action to improve Councils' management of local roads.**

National Roads Authority

5.59 In its discussion paper the Committee asked for comment on a new National Roads Authority. Current national road bodies are, the Australian Transport Council (ATC), the Standing Committee on Transport, AUSTROADS, the National Road Transport Commission (NRTC) and the NRTC Ministerial Council. In addition to the national roads bodies there are 7 State and Territory authorities plus over 800 local council authorities.

5.60 Almost unanimously, responses to the discussion paper were against the establishment of a new national roads authority. The general sentiment was that a new national road authority would result in

administrative duplication and increase the costs of the management of the road network (Submission 86:section 3.7, Submission 87:3).

5.61 The Australian Local Government Association suggests that the most effective course of action may be to rationalise the existing national bodies (Submission 81:1). Given the potential for overlapping and duplication this is a view the Committee supports.

CHAPTER 6
CONSTRUCTION AND MAINTENANCE OF THE ROAD NETWORK

6.1 According to several sources Australia has an efficient road industry. An international benchmarking study of Australia's road construction and maintenance industry suggests that it is equal to or better than any other in the world (Kneebone;1993:11). Also, the Australian Federation of Construction Contractors suggested that Australia is close to world's best practice in road construction (Transcript:177).

6.2 The Committee has no reason to believe that this is not the case. However, this is no reason for the Australian road construction industry to rest on its laurels. There are aspects of road construction and pavement management which can be improved.

6.3 Both the efficiency of road construction authorities management techniques and the efficiency of construction and maintenance operations affect the overall efficiency of the road network. In its analysis the Committee has chosen not to separate these functions as they are interrelated and equally affect overall efficiency.

6.4 In this chapter aspects of road construction and maintenance identified by the Committee as being of importance will be examined with both the above aspects of efficiency being highlighted as appropriate.

Pavement construction and management

Pavement Types

6.5 Different types of pavements are used on Australian roads to suit various conditions. The issue in regard to efficiency is that some types of pavements may be more efficient than others over the long run. The pavements which are compared most often are concrete and bitumen pavement.

6.6 The use of concrete pavement offers several advantages. These are, wholly Australian sourced materials, lower construction energy requirements, lower materials usage, longer life if designed and constructed properly, reduced thickness and therefore less excavation in urban areas (Submission 57:18, 70:40).

6.7 Disadvantages of concrete pavement are, the difficulty in rehabilitation, susceptibility to catastrophic failure, greater tyre noise and economically viable only for roads with heavy traffic volumes (Submission 57:18).

6.8 Benefits of bitumen pavement are that it is easily modified to adapt to changing traffic requirements, has a greater tolerance to construction variation, its darker colour reduces glare, it reduces traffic noise and wet weather spray and its surface can be modified to improve skid resistance, shape or noise reduction properties (Submission 70:40).

6.9 Considering that the increasing concern for much of the national road network will focus on maintenance, rather than construction, concrete pavements with their longer life may be more suitable investment for heavily trafficked road.

6.10 The Committee believes pavement selection should be based on suitability and suitability should be based on a commercial evaluation of the project. As a means of improving road pavement investment decisions a new form of pavement management, life cycle costing, is increasingly being adopted by road authorities.

Life-cycle costing

6.11 Life cycle costing is a means of analysing the total cost of acquisition, construction, operation and maintenance of a product or system for its entire life (BTCE:1990;3). The Bureau of Transport and Communications Economics has developed a life cycle costing model (BTCE:1990).

6.12 Specifically, life cycle costing techniques enable a detailed comparison of rigid and flexible pavements. They enable the assessment of heavy vehicle damage, cost recovery and the benefits of alternative maintenance strategies (BTCE:1993;3). Fundamentally, life cycle costing is a systematic process for evaluating various alternatives with a view to determining the most appropriate use of resources (BTCE:1993;4).

6.13 The Committee believes that road construction and maintenance investment decisions should be based on whole of life costing analysis and endorses the life cycle costing method developed by the BTCE. The Committee encourages all road authorities to adopt the life cycle costing approach for investment decisions.

Utilisation of road plant equipment

6.14 An area of concern is the management of road construction and maintenance plant. It has been put to the Committee, principally by private contractors, that some councils purchase expensive road plant equipment which is often under utilised (Submission 48:13, Transcript:291). The Committee accepts that under utilised equipment does reduce efficiency and that some council equipment may be under utilised.

6.15 However, local government has recognised the gains in efficiency to be made from improved utilisation of plant equipment and resource sharing is taking place (Submission 49:3, 81:7, Transcript:308). The Municipal Association of Victoria points out that resource sharing between councils extends beyond plant to the sharing of professional services (Submission 84:4). Also, councils are gaining access to the latest technology by sharing resources, although the economic climate and the trend to downsizing has reduced the opportunities for resource sharing (Submission 81:7).

6.16 Councils should maximise the use of their own plant with additional capacity being hired to meet peak loads. The Committee believes that all councils should reorganise their operations with the objective of increasing the level of resource sharing.

Tendering

6.17 A system of competitive tendering is a factor in improving the efficiency of road construction and maintenance (Transcript:807). For example, it was estimated that competitive tendering could save governments up to $200m in 1988-89 (Rimmer, cited Kneebone;1993:47).

6.18 There is a growing trend for road construction to be put to tender. The Federal government requires that all Commonwealth funded road projects estimated to exceed $2m must go to tender (Submission 88:4). All States contract out significant amounts of construction work through tender, with the Northern Territory contracting out all roadworks (See Table 6.1).

6.19 States have had some problems with the ability of contractors to complete projects, but more recently this problem appears to be becoming less prevalent, probably due to the introduction of tender prequalification requirements (Transcript:377).

6.20 The widespread introduction of prequalification requirements and provisions to improve the execution of contracts are two means employed by SRAs to improve the tender process. Most SRAs have tender prequalification requirements which are designed to improve the tendering

process. Prequalification was introduced to avoid the cost of accepting the lowest tender and the successful tenderer being unable to complete the project satisfactorily (Transcript:217).

TABLE 6.1

PERCENTAGE OF CONSTRUCTION/RECONSTRUCTION WORK[a] CONTRACTED OUT (1990-91 VALUES)

State	Highways	Main Roads	Other Roads	Total
NSW	53.8	11.3	13.0	39.5
VIC	72.3	-	64.9	70.8[c]
QLD	53.0	30.5	1.2	33.1
SA[b]	54.6	23.9	-	31.5
WA	60.8	15.7	-	45.9
TAS	61.5	22.3	68.0	39.7
NT	100.0	100.0	100.0	100.0
ACT	na	na	na	na

Notes:

a. Does not include costs incurred by SRAs in contract administration on private sector funded road projects.

b. Excludes $5.88m crushed materials supplied by contract.

c. Estimate only.

Source: Kneebone, D., (1993), International Benchmarking Road Construction and Maintenance In Australia, A Discussion Paper, Business Council of Australia.

6.21 Generally, States only contract out a small portion of maintenance work. The Northern Territory is once again the exception with over 80 per cent of maintenance contracted out (See Table 6.2).

TABLE 6.2

PERCENTAGE OF MAINTENANCE WORK CONTRACTED OUT[a]

(1990-91 VALUES)

State	Highways	Main Roads	Other Roads	Total
NSW	na	na	na	6.2
VIC	4.0	-	16.4	5.7[b]
QLD[c]	75	49	-	38
SA[d]	8.9	10.6	-	9.5
WA	19.0	22.5	-	19.6
TAS	8.1	-	-	1.4
NT	98.7	96.1	75.6	86.3
ACT	na	na	na	na

Notes:

a. Does not include costs incurred by SRAs in contract administration.

b. Estimate only.

c. Periodic maintenance only.

d. Excludes $5.88m crushed materials supplied by contract.

Source: Kneebone, D., (1993), International Benchmarking Road Construction and Maintenance In Australia, A Discussion Paper, Business Council of Australia.

6.22 Prequalification systems establish whether a tenderer has the experience, equipment, capital and quality assurance programs to successfully undertake the project (Submission 1:11, Transcript:740). Prequalification requirements are varied to suit the various financial levels at which projects are tendered (Submission 1:11).

6.23 SRAs have implemented measures to improve the effectiveness of the tendering process. For example, the RTA has introduced Conditions of Tendering and a Special Conditions of Contract (Submission 1:11). The conditions of tendering require more detail information earlier in the process allowing for a better assessment of value for money to be made. Using this process the RTA has passed over the lowest tender on several occasions. The Special Conditions of Contract allows for, among other things, alternative dispute resolution procedures and the protection of subcontractors.

6.24 To combat the problem of cost overruns the Queensland Department of Transport has instituted fixed price contracts (Transcript:837). It has been found in Queensland that both private contractors and, more so local councils, bring projects in over budget (Transcript:537). Under fixed price contracts only the agreed price is paid with normal price variations being met. Excess variations are the responsibility of the contractors.

6.25 While no hard evidence was presented it is evident to the Committee that prequalification requirements and improved contract procedures have the potential to improve the tendering process. However, they should not be allowed to unfairly inhibit vigorous competition by preventing some eligible contractors from tendering.

6.26 Currently, competition within the tendering process does not appear to be a problem. With the exception of very remote areas States have not experienced any problem with the number of tenderers for projects (Transcript:365, Kneebone;1993:49).

6.27 The NSW Royal Commission into the building construction industry exposed the practice of successful tenderers reimbursing the costs of unsuccessful tenderers. The Committee is concerned that this practice may have spread to the road construction industry. To avoid this problem most States require tenderers to sign an affidavit or statutory declaration which states that they have not been involved in any collusive dealings (Transcript: 217,511,668). A study commissioned by the Business Council of Australia found that there is no evidence of collusive tendering in the road construction industry (Kneebone;1993:49).

6.28 To gain maximum efficiency benefits from the tender process it should be fair, open and competitive. The Committee recommends that:

7. **All road authorities should require tenderers to swear an affidavit that they are not involved in collusive dealings.**

Project size

6.29 Much has been made during the inquiry about the possible benefits available through increasing the size of a road project. It has been suggested that efficiency improvements of up to 35 per cent are possible by increasing the size of a project. AUSTROADS, however, suggest that 15 per cent may be a more realistic expectation (Kneebone;1993:49). The Queensland Department of Transport indicated improvements in efficiency of up to 7.5 per cent are obtainable by increasing the size of a project (Transcript:827). Whatever the actual size of the benefit may be, the Committee is convinced that improvements in efficiency are possible through increasing project size.

6.30 The Australian Federation of Construction Contractors suggested that contracts should be let only in economic lots (Transcript:171). The Queensland Department of Transport has been told by large contractors that the optimal size of projects, to maximise efficiency, is $5-15m (Transcript:827). Conversely, the Australian Earthmovers Association argue that if contracts are too large small contractors are excluded from tendering for a project (Transcript:176).

6.31 The Shire of Glenelg stated that in some rural areas contractors may not be able to handle a large project (Submission 58:1). Also in many rural areas there is not vigorous competition between contractors (Submission 81:4). In such cases it may be necessary to reduce the size of projects to encourage the participation of local subcontractors who may be better suited to handling smaller projects.

6.32 State government regional development policy considerations are another factor which affects the size of projects being put out to tender. State governments have regional development policies, for example, Queensland has an explicit regional development policy which involves road construction and maintenance. In such cases project size will need to be kept at a level which local councils can handle (Transcript:800,801).

6.33 Increased efficiency is possible through managing project size. The Committee believes that where possible project size should be set to maximise efficiency. However, regional development policies and the ability of some councils to undertake large projects also need to be considered.

Day labour versus contract labour

6.34 The relative merits of contract labour and day labour was raised often during the inquiry. The issue often boils down to competition between state government and council labour and private contract labour.

6.35 There is a growing trend for road construction to be put to tender (Submission 88). The road construction tendering process involves competition between contract and day labour. It was put to the Committee that with the continued development of quality assurance procedures, in many cases contracting is the most efficient means of construction (Transcript: 348). However, in cases where particular expertise or coordination of public services is required construction is still undertaken by day labour (Transcript:338). An example of this is metropolitan road construction under traffic conditions.

6.36 Maintenance, however, is still primarily undertaken by day labour in most States with the exception of the Northern Territory. Some States such as Western Australia have contractors carrying out the slashing of road verges and other minor tasks. NSW is experimenting with contract maintenance in a region in the Sydney area.

6.37 The day labour versus contract labour issue balances on an economic assessment of efficiency. However, it was suggested that government and private contractors are on an unequal footing.The Australian Federation of Construction Contractors suggests that government agencies benefit unfairly through not having to meet the same costs as private contractors, such as payroll tax (Submission 80). On the other hand there are costs which government agencies must meet, from which private contractors are exempt, such as higher superannuation payments and higher on costs (Submission 58).

6.38 Where the viability of a local community is at stake the Queensland Government is establishing a system where an agreement is reached for the council to be the sole invitee to undertake road construction work (Transcript:815). Under this system tenders are not called and the government comes to an agreement with the council to have the work completed. Existing maintenance arrangements will not change (Transcript: 818).

6.39 The Committee believes that the Queensland sole invitee program will benefit remote local communities. Accordingly, the Committee suggests that all State governments look at the possibility of establishing a program to assist remote councils to maintain employment levels.

6.40 The Australian Local Government Association suggests that both council and private contract labour forces have their faults and that it is difficult to say that one is intrinsically better than the other (Submission 81:4). The Shire of Glenelg goes as far as to reject outright the notion that private enterprise may be more efficient than local councils in road construction and maintenance (Submission 58:1).

6.41 Due to paucity of evidence the Committee was unable to gain a clear appreciation of the constraints under which government or private contractors operate and therefore declines to comment on the issue. No conclusive evidence has been presented which shows that one form of labour, by its nature, is substantially more effective or efficient than the other.

6.42 There are other issues associated with the debate which are important (Transcript:507). The maintenance of employment in rural areas is of concern to remote communities (Transcript:508). Because road construction and maintenance employs a large number of local people in some areas, State governments and councils attach great significance to it (Submission 81:4, Transcript:508,801).

6.43 The Australian Local Government Association points out that councils base contracting decisions on many factors, only one of which is price, as the first and overriding responsibility of a council is to the people of the area (Submission 81:4). This responsibility may extend to the provision of employment in the road construction and maintenance area at the expense of road construction or maintenance efficiency.

6.44 There is a significant difference in the resources available to rural and urban councils and this will effect the way in which road works are carried out (Submission 58:3). What may be a big job for a rural council may be considered small a project for which a large urban contractor (Submission 58:3). In such cases project size may need to be adjusted to accommodate the capabilities of a particular council's labour force.

6.45 Associated with the retention of jobs is the need to keep a base of skilled employees in the public sector (Transcript:338). There are several benefits of doing this. A core of people is maintained in the public sector capable of monitoring contract work. Also, there are cases where a project needs be carried out by day labour as the risks associated with the project may be too great for a contractor to undertake (Transcript:338).

6.46 A contrary point of view put forward by the Northern Territory Government is that while expertise may be lost from the public sector it is not lost from the industry, and with the growing adoption of quality assurance practices the quality of road projects should not decline (Submission 86: section 9.4).

6.47 Keeping in mind that different road authorities have different capacities and may have different goals, the Committee believes that each road project should be constructed in the most efficient manner using, the most appropriate form of labour.

Maintenance

6.48 The Committee believes that the maintenance of the road network will emerge as the most important aspect of the road management task. The Bureau of Transport and Communications Economics (BTCE) suggests that the less money spent on maintenance the worse the performance of the road (BTCE;1991: 45,47). Even worse, the BTCE suggests that current levels of funding are insufficient to maintain the NHS at its current standard (BTCE;1991:47,48).

6.49 VIC ROADS told the Committee that their PMS data indicated that there had been a lack of investment in maintenance and the value of the road network was declining. The road asset was valued at $30b in Victoria (Transcript:229). It was estimated that an extra $40m needed to be spent each year to maintain the system properly (Transcript:230). The identification by VIC ROADS of the declining value of the road network highlights an important point concerning the changing nature of the road management task. It has been estimated that by the year 2000 the amount of new construction will decline significantly and 80 per cent of the road management task will be maintenance. VIC ROADS estimates that if the current rate of investment in maintenance is continued, it would cost in the future five to ten times more to get the system back to today's standard (Transcript:230).

6.50 Increasingly, Pavement Management Systems (PMS) and Maintenance Management Systems (MMS) are being used to manage the road maintenance task. PMS and MMS enable the calculation of value of road networks, the depreciation of the asset and needed funds to maintain

the asset in its present condition. These systems not only provide the data for making informed decisions on which activities to fund, they also enhance long term planning and the setting of priorities. Because of the close relationship between PMS and MMS they should be developed in conjunction with each other. The Committee views an increased emphasis on road maintenance as being central to the improved management of the road network.

Pavement Management Systems

6.51 Pavement Management Systems (PMS) assist decision makers in finding optimum strategies for providing and maintaining pavements in a serviceable condition over a given period of time (Submission 1:13). PMS is supposed to increase efficiency of decision making, expand its scope, provide feedback on the consequences of decisions, coordinate activities and ensure consistency of decision making. PMS enables managers to:

- determine the budget required to maintain a road in a particular condition;
- determine the impact on road condition by changes in funding; and
- optimise the choice of treatments for a particular budget.

6.52 The Australian Centennial Roads Development (ACRD) Program required the States to implement PMS and they were required to begin supplying performance information on the NHS to the Commonwealth Government commencing July 1990 (BTCE;Report 77:15). All States put in

PMS data systems and provided information on physical characteristics, traffic, roughness, cracking, rutting and surface texture (BTCE; Report 77:15).

6.53 Until this approach was developed, Commonwealth funding was based on the States' grants program and relied on network information supplied by the States. States have now been supplying PMS data for three years (Transcript:605).

6.54 There have been problems bedding the system down, particularly in establishing comparability between the data supplied by individual States. PMS was used to distribute maintenance funds this year and it has been suggested that this has provided a considerable incentive to the States to get their PMS systems in order (Submission 88).

6.55 The benefit of PMS is that it allows for a longer term view to be taken. The Committee believes that PMS allows for a more objective assessment of the road network to be made and that PMS data should be used to take a broader view of the management of the road network. To this end PMS data should allow for more realistic and measurable objectives for the national road system in the short and long term.

6.56 The Committee recommends that:

8. **The Department of Transport and Communications accelerate the collection of Pavement Management System data from the States and ensure that the data is comparable.**

Maintenance management systems

6.57 Maintenance Management Systems (MMS) provide a needs based budget for maintenance activities and provide detailed information on the productivity and efficiency of maintenance gangs (Submission 1:4). While PMS assesses the effectiveness of maintenance options, MMS addresses the efficiency of the maintenance work itself, ie the two go hand in hand, so if one is not operating it detracts from the effectiveness of the other. The state of development of MMS is well behind that of PMS.

6.58 The New South Wales road transport authority indicates that MMS has achieved savings of 10 - 20 per cent in maintenance budgets in the USA. The authority claims that properly implemented MMS could save it up to $50m per year (Submission 1:14). MMS is now being adopted by road authorities, for example, the RTA has now established MMS systems in all RTA works offices and Western Australia has implemented an MMS system (Submission 50:2, 51:10). The RTA claims that improvements in efficiency are already evident in terms of work practices and the use of productivity targets by maintenance gangs.

6.59 As the increasing importance of the maintenance tasks is one of the major challenges in the management of the road network, it is essential that all road authorities take note of the increasing importance of maintenance in the road management task. Accordingly the Committee recommends that:

9 a) **The Department of Transport and Communications require the implementation of Maintenance Management Systems on National Highway projects.**

b) **The Department of Transport and Communications report on PMS and MMS programs in its annual report.**

6.60 All road networks should benefit from PMS and MMS analysis. Accordingly, the Committee believes that State governments and councils should implement these systems.

Quality assurance

6.61 Quality assurance (QA) is a customer focused process aiming to ensure that procedures and standards are adequate for the intended purpose (Submission 28:5). Quality assurance programs involve a process of continuous improvement (Submission 57:11). As much as anything else quality assurance and total quality management programs are an indication of a new way of operating.

6.62 Under QA the contractor has to outline methods of construction prior to commencement of a project and then monitor the project to ensure that the required level of quality is being met. Efficiency gains are produced by the QA process because it sets a quality standard and reduces the amount of supervision required to achieve it (Transcript: 348). If a quality assurance program is properly implemented and administered government agencies are able to reduce their quality control and supervision costs

(Submission 80:12, Transcript:348). Where faults occur with the system they enable government to analyse the problem and fix it, so that on the next project efficiency is further improved (Transcript: 348).

6.63 The development of QA is an indication of governments' realignment of operational focus from inputs to meeting customer needs. Quality assurance requires a change of attitude by both contractors and government agencies (Submission 1:10, 57:12, 86:section 9.11).

6.64 The Committee notes the increasing adoption of QA practices to ensure that road construction and maintenance projects are carried out efficiently and to required standards (Transcript:470). The move to QA appears to have followed a Commonwealth government requirement for QA on federally funded projects (Submission 69:53).

6.65 Initially there are increased costs associated with the introduction of a quality assurance system (Submission 71:26). The introduction of quality assurance programs has been difficult but no apparent disadvantages have become evident, however, it has been difficult to accurately assess the benefits of the system (Submission 70:34). It was put to the Committee that considerable benefits are available through the introduction of QA systems (Transcript: 470).

6.66 It is important to avoid duplication of quality assurance monitoring. It has been suggested to the Committee that money and resources have been wasted through duplication of quality assurance inspections and excessive supervision (Transcript:434).

6.67 The move by road authorities to implement QA is in line with trends in Australia's manufacturing industries. While there may have been problems in the transition to the adoption of QA techniques the system appears to be improving. The Committee encourages all road authorities to adopt quality assurance as a standard practice in the tendering process. (Submission 88).

6.68 It is evident that the increased adoption of appropriate QA programs adoption within road management systems will result in improved efficiency. The Committee supports those road authorities which have implemented a QA system, and encourages those which have not to assess the benefits available through the introduction of QA and to establish a system where appropriate.

CHAPTER 7
ENVIRONMENT AND TECHNOLOGY

Environment

7.1 Federally funded road projects must comply with the requirements of the *Environment Protection (Impact of Proposals) Act 1974* and Section 30 of the *Australian Heritage Commission Act 1975.* Additionally, State road authorities and councils must comply with their State's environmental legislation and council orders (Submission 82:7). In regard to the construction and maintenance of a large road project, usually, this will entail the conduct of an Environmental Impact Assessment (EIA) (Submission 69:66).

7.2 The Committee believes that the above requirements are sufficient to ensure that environmental factors are taken into consideration by State road authorities and councils when making road planning decisions. Accordingly, the Committee will focus on environmental benefits which may result from improved technology, such as recycling, and on specific environmental problems associated with roads, such as, roadside vegetation and dust. The Committee has chosen not to focus on the environmental benefits of alternative forms of transport. While recognising that pollution is a side effect of transport operations the Committee considered that this issue was outside its terms of reference.

Recycling

7.3 Recycling of road materials is an area where improved technology has also benefited the environment. Recycling has the potential to reduce the cost of road rehabilitation while at the same time reducing the consumption of resources used in road construction and maintenance.

7.4 Substantial benefits are available through recycling road materials. By incorporating lime or cement into recycled pavement the Moree Plans Shire Council saved $310,000 on a 2 kilometer stretch of highway. Also, the South Australian Government has found the recycling of gravel roads through cement stabilisation a cost effective method of rehabilitating rural roads (Submission 57:19). Cement stabilisation has also been profitably undertaken in Victoria (Submission 70:41).

7.5 As high quality gravels necessary for the construction of road pavement are becoming scarce, the Committee views the increasing use of pavement recycling techniques as an important development (Submission 2:8).

7.6 Other road materials are also recycled. The South Australian Department of Road Transport has trialled the in situ recycling of asphalt using a cold recycling process but further development is required (Submission 57:19). In Victoria asphalt has been re-used by incorporating 20 per cent of recycled asphalt into new asphalt (Submission 70:41). Recycled rubber has been used in bituminous surfacing over cracked or distressed surfaces since the 1970s (Submission 70:41). The RTA has been using recycled rubber in bituminous sealings for 15 years (Submission 69:71).

7.7 The commercial viability of recycling needs to be assessed in each case. The Tasmanian Government suggests that new materials are generally cheaper and more readily available than recycling material (Submission 82:7). However, while this may be the case in Tasmania the Committee believes that in larger States where material may have to be carried considerable distances recycling is a feasible alternative to new materials. VIC ROADS suggests that the future of recycling is in creating the ability to treat local materials, so avoiding the need to truck in material (Submission 70:41).

7.8 The Committee believes that all possible benefits from recycling road materials should be maximised. All levels of government should have information on which to base planning decisions. Accordingly the Committee recommends that:

10. a) The Australian Roads Research Board establish an ongoing project to evaluate road material recycling techniques and their role in improving the efficiency of road construction and maintenance.

b) The project results be made available to government, industry and interested parties.

Roadside vegetation

7.9 Most SRAs are required to protect or rehabilitate roadside vegetation. This responsibility extends to undertaking vegetation surveys, replanting programs and the establishment and management of borrow pits.

7.10 The South Australian Department of Road Transport has a system by which all road side vegetation is surveyed prior to a project being undertaken (Submission 57:19). If vegetation is removed during a project mitigation measures are taken. The Department has a replanting/revegetation scheme (Submission 57:19).

7.11 VIC ROADS has commenced vegetation surveys and is preparing roadside management plans for many roads under its control (Submission 70:41). The Tasmanian Government has established a data base to identify those areas where disturbance of the environment due to road construction is required to be kept to a minimum (Submission 82:8).

7.12 The RTA has a system of collecting seeds from roadside vegetation which is to be removed and replants the roadside with the same species (Submission 69:73). Seeding regeneration methods developed by the RTA have won Greening Australia awards (Submission 69:73).

7.13 Where borrow pits are developed, procedures are in place to strip and stockpile top soil. When a pit is closed the top soil is respread and the area is landscaped (Submission 57:19, 69:74).

7.14 Measures taken to protect and replace road side vegetation appear to the Committee to be adequate.

Dust

7.15 Dust may be a problem where it effects a roadside town, aquatic environment or agricultural area (Submission 69:74, 70:42). In a sparsely populated state such as South Australia dust is not seen as a problem, however, sealing is carried out in towns (Submission 57:20).

7.16 VIC ROADS suggests that decisions of sealing are more an economic decision than environmental. Due to the remote location of roads where dust may be a problem the cost of eradicating the problem may be prohibitive in proportion to the benefits gained (Submission 70:41).

7.17 Control of dust is a problem in some areas and in areas where dust is a problem it should be addressed. However, the Committee believes that the need to control dust should be balanced against the commercial viability of measures taken to control it.

Technology

Adoption of technology

7.18 It has been argued during the inquiry that SRAs are conservative in the adoption of new technology (Submission 5:3). Private contractors, for example Emoleum, suggested that the slowness of SRAs to take up new technology is the cause of inefficiencies (Submission 25:3.1.1).

Suggested reasons for this conservative outlook are a vested interest in existing plant and equipment and a desire to maintain current employment (Submission 5:3). The Queensland Government states that in the past SRAs may '... have failed to provide adequate incentive for innovation and upgrading by private contractors' (Submission 87:7).

7.19 The Committee accepts that while this criticism may have been accurate 20 years ago, currently there is ample evidence of SRAs and local government adopting appropriate new technologies, such as, pavement and asphalt recycling technology or improved concrete pavement construction techniques. For example, the development of twin-bar sprayers in Western Australia, new bridge repair techniques in NSW and the development of new geotextile reinforced seals in the Northern Territory (Submission 54:2, 86:10.1, Transcript: 510).

7.20 Australian conditions have resulted in an expertise in constructing low cost flexible pavements (Submission 70:36). In such areas of polymer modified bitumen, open graded asphalt, strain alleviating membranes and low energy processes for bitiminous surfaces Australian asphalt technolgy is very advanced (Submission 57:13). This expertise has resulted in Australian involvement in road projects in developing Asian countries (Submission 70:36,37).

7.21 Much research expenditure is spent on assessing the viability of overseas technology for Australian conditions (Submission 57:14). Main Roads Western Australia suggests that up to 25 per cent of research funds is used in this area (Submission 71:30). It has been suggested that excessive testing requirements on behalf of government prevent the Australian road

construction and maintenance industry from gaining full benefit from overseas technology (Transcript:104).

7.22 VIC ROADS make the point that often not enough emphasis is placed on the applicability of overseas methods to Australian conditions (Submission 70:35). Conditions which affect the application of overseas technology include, diversity of climate, availability of raw materials, transport patterns, settlement patterns, cost structure, economic environment and social and cultural norms (Submission 70:36).

7.23 WA Main Roads suggests that the sparse population in Australia does not lend itself to the direct adoption of expensive European or American road technologies (Submission 71:31). An additional problem with new technology is that the cost of new machines means that they are economical only on large projects, consequently, there may not be a sufficient volume of work to justify some new technology (Submission 87:8).

7.24 Often overseas technology is enhanced to enable it to better cope with Australian conditions (Submission 57:14). For example, hot and cold recycling processes, Falling Weight Deflectometer software, Deflectorgraph Electronics and different types of seal designs are all overseas developments which have been modified for Australian conditions (Submission 57:14).

7.25 The Committee believes that the adoption of technology should be carefully evaluated. It may not be the case that technology automatically provides a cost advantage. For instance, polymer modified binders cost about twice as much as normal binders but may not deliver twice the performance (Submission 51:16). This is especially the case as recent

developments in asphalt technologies will result in it remaining, for some time, the most cost effective solution in most cases (Submission 51:16).

7.26 The Committee believes that it is beneficial for the efficiency of the Australian road construction and maintenance industry that it receive the latest technology from overseas. The Committee recommends that:

11. AUSTROADS monitor and evaluate the take up rate of cost effective overseas technology by road authorities in Australia.

Information availability

7.27 The two major sources of information are AUSTROADS and Australian Road Research Board (ARRB), both of which are jointly funded by all three levels of government (Submission 70:36). Research information is available from several sources. AUSTROADS and ARRB provide research information, the Research-in-Progress data base is available for access and SRAs, Austroads and ARRB organise conferences, workshops and seminars (Submission 57:14).

7.28 National data bases which register road and transport research have been established (Submission 70:36). At this stage these data bases are not well developed but it is planned to develop them further (Submission 70:36). ARRB contributes to and has access to the International Road Research Program, a data base of international publications and research (Submission 70:36).

7.29 The Committee considers it important that industry and government exchange research information. In some States a close relationship is maintained with industry (57:14, 70:36). It was put to the Committee that information flows between government and industry are improving (Transcript:110). The Committee believes that the exchange of information between government and industry is necessary for the continued improvement in road construction and maintenance efficiency.

7.30 While information dissemination may be improving the Committee believes it could improve further. In what is a good example of how to improve dissemination of information VIC ROADS has appointed a Coordinator, Research and Development who is responsible for the internal and external dissemination (Submission 70:35). The Committee encourages other SRAs to introduce a similar system.

Development of research/research funding

7.31 Research into roads in Australia is principally carried out by the Australian Road Research Board (ARRB) and the State road authorities. The Commonwealth Government, all State governments and the Australian Local Government Association contribute collectively about 60 per cent of the Australian Road Research Board (ARRB) funds. ARRB collects the remaining 40 per cent from commercially earned income (Transcript: 694,695). ARRB has an annual budget of approximately $10m (Transcript:691)

7.32 Funding is also provided by local government. Local government has been contributing funds to ARRB, effectively underwriting the transfer of information to councils (Submission 81:7).

7.33 Private funding of road research is minimal (Submission 71:29). Given the $6b outlay by governments on roads each year the minimal expenditure on research by the private sector is indeed surprising. The Committee believes that the private sector should be more active in road research and development.

7.34 Main Roads Western Australia is of the opinion that insufficient research is carried out in Australia. It is considered that the lack of research is a national problem and a solution requires a cooperative effort on behalf of government and the industry (Submission 71:29). VIC ROADS suggest that 1-2 per cent of annual budgets should be spent on research and development, however, in the current economic climate most SRAs would not be achieving this target (Submission 70:35).

7.35 Several means of developing research were suggested during the inquiry. One means of improving the research effort is for government to adopt the French approach and guarantee a certain amount of work to a company to establish new technology before the technology goes on to the open market (Transcript:109). The Committee does not believe that government should underwrite the development of technology by private firms. Firms involved in road construction or maintenance should accept the risk of developing technology as firms in other industries do.

7.36 The Committee considers that the continued marketing of technology overseas is a useful means of developing Australian road research. Australian technology is often marketed overseas. For example, the Accelerated Loading Facility has been successfully marketed in the USA and China (Submission 57:16). VIC ROADS development of noise attenuation fences used adjacent to major roads is a good example leading edge technology (Submission 70:36). Another Australian development which has been marketed overseas is the traffic management system SCATS (Submission 70:36). The Committee believes that the continued success in overseas markets will further encourage the development of Australian road research.

7.37 VIC ROADS has established in-house Innovations Awards, Centres for Expertise and a Corporate Research and Development Program to promote technical expertise (Submission 70:38). The Committee supports this initiative and encourages other governments and industry to adopt this approach.

7.38 The Committee believes that research is important for the continued improvement of road construction and maintenance and agrees that research and development funding should be increased.

PETER MORRIS MHR
Chairman

13 December 1993

REFERENCE LIST

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APPENDIX 1

CONDUCT OF THE INQUIRY, EVIDENCE AND WITNESSES

1. The House of Representatives Standing Committee on Transport, Communications and Infrastructure was appointed under Sessional Order 28B on 8 May 1990 in the 36th Parliament. The Committee is empowered to inquiry into and report on any matter refereed to it by either the House or a Minister.

2. On 13 February 1991 the Committee received a reference from the then Minister for Land Transport, the Hon Bob Brown, to inquiry into the efficiency of road construction and maintenance industry. The reference was advertised in the Australian Financial Review on 12 June 1991 and the Weekend Australian on 15 June 1991. The advertisements asked for submissions to lodged by 19 July 1991.

3. With the dissolution of the House of Representatives on 8 February 1993 for a general election, the Committee ceased to exist. The Committee was re-established in the new Parliament and on 22 June 1993 the Inquiry was re-referred to the Committee by the Minister of Transport and Communications, the Hon Bob Collins. The terms of reference were unchanged and the Committee had access to the inquiry evidence and records of the previous Parliament.

Public Hearings

4. The Committee carried out the following series of inspections and public hearings in the course of the inquiry:

6 April 1992	Albury	inspection and public hearing
16 April 1992	Sydney	public hearing
13 May 1992	Melbourne	public hearing
1 July 1992	Brisbane	public hearing
2 July 1992	Moree	inspection
22 July 1992	Perth	inspection and public hearing
31 August 1992	Canberra	public hearing
9 September 1992	Canberra	public hearing
28 September 1992	Launceston	public hearing
15 July 1993	Melbourne	inspection
25 August 1993	Brisbane	public hearing

Evidence

5. The evidence consists mostly of written submissions made to the Committee, oral evidence taken at public hearings and documents received in the course of the inquiry.

6. Eighty eight submissions were received. The written submissions which have been authorised for publication along with the oral evidence will be bound and copies sent to the National Library and Parliamentary Library. A set will be retained in the committee office.

7. The submissions authorised for publication are as follows:

SUBMISSION NUMBER	ORGANISATION/PERSON
1	NSW Government Roads and Traffic Authority
2	Cement & Concrete Association of Australia
3	Mr W H Keating
4	Road Stabilisers
5	Inroads Road Technology
6	Rail 2000 Incorporated
7	Australian Earthmovers & Road Contractors Federation
8	The Local Govt Engineers' Association of Qld Inc
9	Australian Federation of Construction Contractors
10	Mr R Brown
11	Dr G Dick
12	John Holland Construction Pty Ltd
13	The Local Govt Engineers Association of Vic
14	Australian Roads Federation

15	Boral Asphalt
16	Austroads
17	L B Wire Ropes Pty Ltd
18	Mr/Ms A Redei
19	Lane Cove Municipal Council
20	City of Doncaster and Templestowe
21	National Roads & Motorists' Association
22	Australian Automobile Association
23	Mains Roads of Western Australia (WA Government)
24	Greenpeace
25	Emoleum (Australia) Ltd
26	Chemcrete
27	Tasmanian Government
28	South Australian Government
29	Victorian Government
30	Queensland Government
31	MAUNSELL Pty Ltd
32	Shire of Heytesbury Vic

33	Australian Steel Mill Services Pty Ltd
34	Albury City Council
35	Rural City of Wodonga
36	Albury Wodonga By-Pass Consultative Group
37	Hume Shire Council
38	Mr&Mrs A Douglass
39	Australian Earthmovers & Road Contractors Federation (Victorian Branch)
40	Australian Road Federation
41	J Brett
42	Australian Earthmovers & Road Contractors Federation (Tasmanian Branch)
43	Australian Earthmovers & Road Contractors Federation (Queensland Branch)
44	Vic Roads
45	Australian Earthmovers & Road Contractors Federation (Victorian Branch)
46	The Treasury Canberra ACT
47	Department of Transport and Works Darwin

48	Australian Earthmovers & Road Contractors Federation (WA Branch)
49	Western Australian Municipal Association
50	Main Roads Department WA
51	Roads and Traffic Authority
52	Mrs B Cumming
53	Newcastle Sub-Branch Transport Workers Union of Australia
54	Moree Plains Shire Council
55	The Local Government Association of Queensland
56	Department of Transport and Communications
57	Department of Road Transport SA
58	Shire of Glenelg
59	The Shire of Ballarat
60	Maunsell Pty Ltd
61	Australian Federation of Construction Contractors
62	Calder Constructions Pty Ltd
63	Cement and Concrete Association of Australia

64	National Roads & Motorists' Association
65	Queensland Department of Transport
66	BP Australian Limited
67	Cr RR Holloway
68	Australian Earthmovers & Road Contractors Federation
69	Roads and Traffic Authority NSW
70	Victoria Transport
71	Main Roads Western Australia
72	Main Roads Western Australia
73	Austroads Inc
74	Shire of Heytesbury
75	Australian Road Federation
76	East Gippsland Road Funding Promotion Group
77	Institute Municpal Engineering Australia
78	Australian Road Research Board Ltd
79	Australian Earthmovers & Road Contractors Federation

80	Australian Federation of Construction Contractors
81	Australian Local Government Association
82	Tasmanian Government
83	Road Transport Forum
84	Municipal Association of Victoria
85	Mrs B Cumming
86	Department of Transport and Works, Northern Territory
87	Minister for Transport Queensland Government
88	Department of Transport and Communications

Exhibits

8. The following exhibits were received in the course of the inquiry.

EXHIBIT NO	DESCRIPTION
1	Albury Wodonga Bypass Consultative Group
2	Albury Wodonga Bypass Consultative Group
3	Albury Wodonga Highway Bypass
4	Volaufige amtliche endergebnisse

5	Verkehrs-Gewimmel in deutschland
6	Maschinen fur den Strabenbau
7	Rowena Advisory Committee to Walgett Shire Council
8	Main Roads Western Australia - Overview
9	Main Roads Western Australia - Notes for the Inspection of Roads in the Pilbara and Kimberley Regions of Western Australia
10	Cement and Concrete Association of Australia - Concrete Roads A Must for the Eastern Corridor Development Programme
11	Cement and Concrete Association of Australia - Comment on the Inquiry into the Efficiency of Road Construction and Maintenance Industry Discussion Paper, June 1992
12	Proposals for the Future Administration of the National Highway System
13	Untying of Commonwealth Road Funding

Witnesses

9. The following witnesses appeared before the Committee and were examined:

ALBURY: 6 APRIL 1992

Rural City of Wodonga

- Mr Leslie Boyes, Mayor
- Mr Bruce Pooley, Director of Technical Services

Albury-Wodonga Environment Centre

- Mr Martin Greig
- Ms Judy Spry

Albury City Council

- Alderman Leslie Langford, Mayor
- Mr Raymond Stubbs, Chief Executive Officer

Albury-Wodonga Bypass Consultative Group

- Mr Alan Lane, Committee Member
- Mr Maxwell Mumford, Convenor
- Mr Richard Rodd, Chartered Professional Engineer and Member

National Farmers Federation

- Mr James Jelbart, President

Albury-Wodonga Development Corporation

- Mr Graham Oke, Economist

Hume Shire Council

- Mr Anthony Quinn, President
- Mr Donal Pollard, Clerk

SYDNEY: 16 APRIL 1992

Boral Asphalt (NSW)

- Mr Russell Erwin, General Manager

National Roads and Motorists' Association

- Mr Alan Finlay, Manager, Transport Policy
- Mr Bruce Searles, Assistant General Manager, Public Policy

Roads and Traffic Authority

- Mr Ulf Fraser, Director, Southern Region
- Mr Phil Gallagher, General Manager Engineering Contracts
- Mr Stephen Vine, Divisional Engineer
- Mr Peter Wolfe, Director, Corporate Strategy

Australian Federation of Construction Contractors

- Mr Larry King, ACT Director

Australian Road Federation

- Mr Bruce Loder, National President

MELBOURNE: 13 MAY 1992

City of Doncaster and Templestowe

- Mr Colin Bates, Manager
- Mr John Prince, City Engineer, Group Manager

Local Government Engineers Association of Victoria

- Mr Edmund Oppy, Member of State Executive, Chairman of Roads and Transport Panel

Australian Earthmovers and Road Contractors Federation

- Mr Geoff Brown, National President and State Councillor, Victorian Division
- Mr Kenneth Edgley, Councillor
- Mr Ian Jacka, State President
- Mr Gary McClure, Bendigo President, Country Division

Chemcrete Asia Inc

- Mr Colin Farrow, Australian Representative

Maunsell Pty Ltd

- Mr Anthony Herbert, Director, Roads and Traffic
- Mr James Leslie, Director

Roads Corporation of Victoria

- Mr Reginald Patterson, Chief Executive Officer

BRISBANE: 1 JULY 1992

John Holland Constructions Pty Ltd

- Mr Richard Barton, State Manager, Civil Engineering
- Mr Paul Commins, Project Manager

Australian Earthmovers and Road Contractors Federation

- Mr Neil Brady, Member, Queensland Branch
- Mr Michael Chamberlain, President, Queensland Branch
- Mr Malcolm Johnson, Committee Member

- Mr George Leader, Managing Director, Bielby Constructions Pty Ltd and Bielby Holdings Pty Ltd
- Mr Reiner Wenzel, Managing Director, Link Pty Ltd

Department of Transport

- Mr Terence Emery, Senior Policy Adviser
- Mr Allan Krosch, Principal Manager, Road Works Infrastructure Delivery Efficiency Project
- Mr Alan McLennan, Director of Transport Technology
- Mr Donald Muir, Regional Director Central Queensland
- Mr William Upton, Executive Director, Infrastructure Development

PERTH: 22 JULY 1992

Western Australian Municipal Association

- Mr Edward Chown, Deputy Executive Director
- Councillor Joseph North, President, Country Shire Councils Association

Main Roads Western Australia

- Mr Barry Clarke, Director, Metropolitan Operations
- Dr Kenneth Michael, Commissioner of Main Roads
- Mr Ralph Moore, Director, Operations Services

Australian Earthmovers and Road Contractors Federation, Western Australian Branch

- Mr Lance Croker, President
- Mr Greg Murphy, Committee Member

- Mr Kevin Myers, Executive Officer
- Mr Hans Versteeg, Vice President

CANBERRA: 31 AUGUST 1992

Cement and Concrete Association of Australia

- Mr John Hodgkinson, Pavements Engineer
- Mr Walter Ryan, Chief Executive Officer

Department of Transport and Communications

- Mr Andrew Hrast, Director, Road Program Working Group
- Ms Susan Page, Acting Assistant Secretary, Roads Management Branch
- Mr Christopher Thorpe, First Assistant Secretary, Land Transport Policy Division

Austroads

- Mr Colin Jordan, Program Manager, Road Use Management
- Mr Reg Patterson, Acting Chairman
- Dr Robert Wilson, Executive Director

Department of Road Transport

- Mr Dixon, Engineering Development
- Mr Rodney Payze, Executive Director
- Mr Andrew Rooney, Manager, Infrastructure Planning

Australian Road Research Program

- Dr Ian Johnston, Executive Director
- Dr John McLean, Manager, Transport Efficiency Research Program
- Mr Kieran Sharp, Manager, Road Infrastructure Program

LAUNCESTON: 28 SEPTEMBER 1992

Tasmanian Department of Premier and Cabinet

- Mr Michael Polegaj, Senior Policy Analyst
- Mr Anthony Wilson, Deputy Secretary, Transport Infrastructure

BRISBANE: 25 AUGUST 1993

Queensland Department of Transport

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STATE ROAD CLASSIFICATION

New South Wales

1. In New South Wales the traditional classification of roads, are provided for under the *Roads Act 1993.*

2. In 1989 the RTA and Local Government agreed to initiate a move towards a new system of management arrangements based on State, Regional and Local Road categories.

3. Whilst the new system has not been formally promulgated in legislation pending further clarification of responsibilities and arrangements, funding and managing the networks are increasingly being based on the new road categories.

4. State Roads comprise the principal arterial road network within the Sydney network, and the principal arterial country roads which provide an interconnected network between all the major provincial cities.

5. Regional Roads are the secondary network of roads comprising sub arterial roads in the major urban areas, and country roads connecting important towns with the State network and with each other. The network

includes the lesser trafficked Main, Secondary and Tourist Roads as well as some Unclassified Roads, particularly in the Metropolitan area. These roads continue to be the responsibility of Councils.

6. Local Roads comprise the remaining network of public roads for which Councils are responsible. The RTA provides some funding assistance through special programs and block funding for traffic facilities.

7. Under this new system, the categories of Freeway, Controlled Access Road and Toll Road will continue as sub sets of the State Road network. The State Work category will also continue.

8. Toll Roads are usually Freeway standard roads where a toll applies. Toll Roads may be operated by the RTA or by private companies.

Revenue

9. The principal sources of revenue available for the classified road system within NSW are as follows:

- All monies received from the Commonwealth by way of grants for roads made under relevant Acts.
- Motor vehicle registration weight tax and tax levy (as distinct from registration fees)
- State loan allocations
- Semi-Government loan allocations.
- Appropriation by the State Government for traffic Facilities from Road Transport and Traffic Fund

Victoria

10. The various classifications of Victoria's roads are declared or proclaimed under the provisions of the Country Roads Act 1958.

11. State Highways are the principal arteries forming interstate connections and links between the larger centres of population in the State.

12. Freeways are roads generally having dual carriageways with no direct access from adjoining properties and side roads. All crossings of a freeway are by means of overpass or underpass bridges, and traffic enters or leaves the freeway carriageways by means of carefully designed connecting roads or ramps. VIC ROADS carries out all works on freeways.

13. Tourists' Roads provide access to places of special interest to tourists, both in summer and winter.

14. Forest Roads are situated within or adjacent to a State forest or in areas which are considered by VIC ROADS to be timbered, mountainous or underdeveloped.

15. Main Roads are roads linking centres of population with other centres or with areas of industry, commerce or settlement.

Revenue

16. The principal sources of revenue available for the classified road system within Victoria are as follows:

- All monies received from the Commonwealth by way of grants for roads made under relevant Acts;
- Receipts from motor registration fees;
- Fuel franchise fees;
- Drivers licence fees;
- Appointment and testing fees and other such receipts as paid into Consolidated Revenue;
- Contributions by municipal Councils in respect to main roads; and
- Loan monies.

Queensland

17. Categories of declared roads as at 30 June are as follows:

18. State Highways are those roads which form the State's basic road network by linking major regions and connecting ports to their hinterlands. These are the principal corridors for long distance traffic and give the most important road connections to neighbouring States.

19. Developmental Roads are the principal roads within large less developed areas and provide connections between the highway system and large tracts of sparsely settled country.

20. Main Roads connect towns and closely settled areas with one another and with the highway system to form a network of important roads between the highways, and serve as collectors for lesser rural roads.

21. Secondary Roads constitute the principal roads for local traffic in rural areas. They provide important avenues of movement within each local authority and serve as collectors for roads of lesser importance.

22. Urban Arterial Roads are urban roads serving as the principal arteries for large 'through' traffic movement, or as extensions of State highways.

23. Urban Sub-Arterial Roads are roads in urban areas supplementing urban roads for 'through' traffic movements or distributing traffic between arterial roads and the local street systems.

Revenue

24. The sources of revenue available are:

- Monies received from the Commonwealth Government by way of grants for roads made under relevant Acts.
- Motor vehicle registration receipts.
- Loan money and repayable receipts.
- Miscellaneous minor revenue from other sources.

Western Australia

25. The Main Roads Act 1930 provides for the following Classifications of roads.

26. Highways are roads which provide direct connections between Perth and other State Capitals, are the routes between major producing regions of the State, are the routes between major centres of population of the State, and are the principal routes for high volume traffic movements within large urban areas.

27. Main Roads are roads which connect existing or potentially large producing areas and their markets or closest ports or railway stations, the main routes between existing or potentially large producing areas, or between large population centres, or will form the major routes for high volume traffic movements within large urban areas.

28. Secondary Roads are roads which are the feeder routes connecting producing areas with a highway or main road, or with their market outlets, are feeder routes connecting population centres, or are main means of access to national parks, scenic reserves or sites and seaside resorts.

29. Roads other than Declared Roads include roads which have not been declared to be highways, main roads or secondary roads.

Revenue

30. The sources of revenue available for the classified road system in WA are:

- Commonwealth grants for roads under the Australian Land Transport Development Act;
- 'Untied' Commonwealth grants;

- Revenues raised by the Commonwealth from charges on commercial vehicles under the Interstate Road Transport Act;
- Natural disasters assistance;
- Motor Vehicle Licence Fees;
- Fuel Franchise Levy (on petrol and road use distillate);
- Loan Funds;
- Oversize and Overload Permits;
- Contributions by Local Governments, other agencies and private concerns for works undertaken on their behalf; and
- Miscellaneous minor receipts from sale of assets, rents, etc.

South Australia

31. In South Australia there are approximately 95151km of roads. Under arrangements agreed to between State and Local Government these roads are classified as either arterial roads or local roads, based on the NAASRA functional classification system. Local Government accepts responsibility for the maintenance and management of local roads and State Government, through the agency of the Department of Road Transport (DRT), accepts responsibility for arterial roads and local roads in the unincorporated areas of the State. Certain arterial roads in South Australia are also classified as National Highways in accordance with Commonwealth legislation.

32 The Classification and responsibilities for roads in South Australia are:

- National Highways are the responsibility of the Department of Road Transport (DRT);
- Arterial roads are the responsibility of the DRT;

- Local roads in the unincorporated areas of the State are the responsibility of the DRT; and
- Local roads in incorporated areas are the responsibility of Local Government.

Revenue

33. The principal sources of revenue available are:

- All monies received from the Commonwealth Government by way of grants for roads under relevant Acts;
- Motor vehicle taxation and drivers' licence fees;
- Revenue received from the Business Franchise (Petroleum Products) Act 1979;
- Allocation of loan money;
- Charges for use of Departmental Sea Transport Services; and
- Miscellaneous minor revenue comprising rentals of Departmental properties, interest on loans to local authorities, contributions from local authorities for lighting of main roads and hawkers' licences.

Tasmania

34. The following two categories of proclaimed State roads are provided for in the *Roads and Jetties Act of 1935.* State Highways are the principal urban and rural arterials and include Federally funded National Highways and State funded highways; Subsidiary roads and are classified as either, main roads, secondary roads, developmental roads and tourist roads.

35. The subsidiary road classifications are legal definitions based on past practice and were intended to reflect the importance and /or function of a road.

36. Currently, State roads are being reassessed by function and role whereby all such roads will fall into one of three categories:

37. State highways are to be either Category 1 or Category 2 roads with a policy for statutory access control.

38. Subsidiary roads that have a lesser arterial function will be Category 3 roads.

39. Those roads with a mainly local role should become Local Government roads. A number of these latter roads have already been transferred as part of the rationalisation process and further transfers are necessary.

40. Legislative changes at present before State Parliament will remove the only statutory contributions from Local Government towards the cost of constructing and maintaining State roads, ie the very small contributions for main roads and secondary roads.

Revenue

41. The principal sources of revenue available for the classified road system are as follows:

- All monies received from the Commonwealth by way of grants for roads made under relevant Acts.
- *Motor vehicle tax receipts;*
- Public vehicle transport fees, ie of area permits, passenger and freight tax etc;
- Loan receipts for new construction work, purchase of plant, renewal of certain major bridges and for provision of depot buildings;
- Local authority contributions towards the maintenance of certain classified roads;
- Woodchip industry road tolls
- Fines from prosecutions for overloaded vehicles; and
- Miscellaneous minor revenue such as supervision fees, sale and rental of Departmental properties.

Northern Territory

42. The Departmental Classifications in the Northern Territories are:

- Highways/Primary Arterials which are the principal avenues of road communication with the Northern Territory and interstate;
- Main Roads are the major avenues of road communication connecting important areas and key towns to one another or to the highway network;
- Secondary Roads act as feeder roads connecting areas of significant rural development with the Highway and Main Road network, and providing access to important centres;

- Local Roads are lesser important roads providing access to properties, mines, tourist attractions; and
- Other urban local roads controlled by local government and Department of Community Development.

Revenue

- All monies received form the Commonwealth by way of grants for roads made under relevant Acts;
- Receipts from motor registration fees;
- Receipts from drives licences; and
- Receipts from transport licences and fees and other such receipts paid into the Northern Territory Consolidated Revenue.

APPENDIX 3

LOCAL ROAD EXPENDITURE SUMMARY

Local Roads Expenditure Summary

Name of Council	Accumulated Reserves	'Others' funds spent on Council roads	Council spending on 'Others' roads	Work undertaken for other Governments	Year Ended
	$	$	$	$	

Councils Own Roads – COSTS – EXISTING ROADS

Urban roads

	Current Replacement Cost 1/7/9___	Written Down CRV 30/6/9___	Status Quo Cost 199___/9___	Actual Expenditure 199___/9___	Budget 199___/9___
Roads					
Bridges/Culverts					
Ancillary					

Rural roads

Sealed					
Unsealed					
Natural Surface					
Bridges/Culverts					
Ancillary					
			Transfer to RRR		
TOTAL					

Councils Own Roads – NEW WORKS

	Actual Spent 199___/9___	Current Budget	Next Budget
Sealed Pavement			
Sealed Earthworks and drainage			
Unsealed Pavement			
Unsealed Earthworks and drainage			
Natural Surface Pavement			
Natural Surface Earthworks and drainage			
Bridges			
Ancillary			
Sealed Pavement			
Sealed Earthworks and drainage			
Unsealed Pavement			
Unsealed Earthworks and drainage			
Natural Surface Pavement			
Natural Surface Earthworks and drainage			
Bridges			
Ancillary			
TOTAL			

Please read the notes on the back of this form

Explanation

Council controlled roads – Costs – Existing Roads

All expenditure to either maintain or restore the condition of a road up to but not beyond its original standard is shown in this section.

Council controlled roads – New Works

Expenditure incurred in creating new roads, or *significantly* upgrading roads, is shown in this section.

Urban roads

Roads in the area zoned 'urban, industrial or commercial'.

Rural roads

Roads in the area zoned 'rural'.

Use of form

This form could be presented to Council as a draft when the new financial year Budget is being determined.

Information on the form should be forwarded to the data collection point when final expenditure figures are available as early as possible in the new financial year.

RELEVANT TO THE YEAR UNDER REVIEW

Accumulated Reserves

This is money the Council has put aside for future capital works. These funds must be available for road works, but are not necessarily for road works only.

'Other's funds spent on Council roads

In some Councils the private sector spends money on maintaining **specific** roads owned by Council and sometimes State or Federal Governments pay for **specific** work on Council owned roads. Excluded from this figure are payments where Council has discretion in the use of funds or where the roads are not yet owned by Council (as in some development contribution arrangements).

Council spending on 'Others' roads

This covers Council spending on tourist, regional and other roads which are not technically the responsibility of Council.

Works undertaken for other Governments

Amount of Council resources for maintenance of State and Federal Government controlled roads (i.e. State highways and main roads.

Replacement cost (current)

This is the cost of building the road(s) at current prices to the original standard. This information will give Council a bench mark against which the consumption of roads can be measured.

Written Down CRV

I.e. Written Down Current Replacement Value

This is an estimate of the life left in a road, assuming appropriate maintenance. Usually this will be based on a calculation by the Engineer / Works Manager on how much it would cost to bring the road up to near new standard. This figure is then subtracted from the Replacement Cost to give the Written Down R/V.

Actual Spent

This is the amount actually spent on maintenance and rehabilitation by the Council on Council's own roads during the year under review.

Transfer to RRR

RRR means Road Replacement Reserve. This is the other side of the 'Status Quo – Dep. Charge' equation. It represents the extent to which funds were raised during the year under review to fund the depreciation costs for the period.

RELEVANT TO THE NEW FINANCIAL YEAR

Status Quo

This is the total amount of money which in the opinion of the Engineer or Works Manager needs to be spent on the Council's road network in the **new** financial year, so that the roads are in the same condition at the end of the period as they were at the beginning.

Budget

This is the amount Council decides to spend in the new financial year on its own roads.