

The Auditor-General  
Audit Report No.21 2000–2001  
Performance Audit

# **Management of the National Highways System Program**

**Department of Transport  
and Regional Services**

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of Australia 2001

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Canberra ACT  
8 February 2001

Dear Madam President  
Dear Mr Speaker

The Australian National Audit Office has undertaken a performance audit in the Department of Transport and Regional Services in accordance with the authority contained in the *Auditor-General Act 1997*. I present this report of this audit, and the accompanying brochure, to the Parliament. The report is titled *Management of the National Highways System Program*.

Following its tabling in Parliament, the report will be placed on the Australian National Audit Office's Homepage—  
<http://www.anao.gov.au>.

Yours sincerely



P. J. Barrett  
Auditor-General

The Honourable the President of the Senate  
The Honourable the Speaker of the House of Representatives  
Parliament House  
Canberra ACT

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# Abbreviations/Glossary

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ALTD Act	<i>Australian Land Transport Development Act 1988</i>
ANAO	Australian National Audit Office
ATC	Australian Transport Council
ATSB	Australian Transport Safety Bureau
Austrroads	The National Association of State and Territory Road and Traffic Authorities (formerly NAASRA)
BCR	Benefit-Cost Ratio
BTE	Bureau of Transport Economics
CRF	Consolidated Revenue Fund
DEA	Data Envelopment Analysis
DOTAC	Department of Transport and Communications (pre 1996)
DTRS	Department of Transport and Regional Services (post 1996)
FMA Act	<i>Financial Management and Accountability Act</i>
HORSCCTMR	House of Representatives Standing Committee on Communications, Transport and Microeconomic Reform
JCPAA	Joint Committee on Public Administration and Audit
LCC	Life Cycle Costing
NRM	NAASRA Roughness Measure
NRTC	National Road Transport Commission
NTS	National Transport Secretariat
RONI	Roads of National Importance
SCOT	Standing Committee on Transport
SPP	Specific Purpose Payment
SRA	State (or Territory) Road Authority

# **Summary and Recommendations**





# Summary

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## Background

1. In 2000–01, the Commonwealth has budgeted to spend \$1.45 billion on roads (includes additional funding from the Roads to Recovery Program announced on 27 November 2000) of which the National Highway System will receive \$710 million and Roads of National Importance (RONIs) \$149 million.<sup>1</sup> The Commonwealth has funded the States and Territories (States) for road construction and maintenance since the 1920s. In 1974, the Commonwealth Government declared a series of capital city road links as National Highways and has since then contributed in excess of \$14 billion to the maintenance and construction of the National Highway System.

2. The Department of Transport and Regional Services (DTRS) provides policy advice to the portfolio Ministers and delivers a range of programs and services on behalf of the Commonwealth Government. The administration of the National Highway System (and RONI) Program involves the development of a five year forward strategy, assessing States' nominated projects and advising the Minister on priorities for competing funding applications.

3. The *Australian Land Transport Development Act 1988* (ALTD Act) provides the legislative framework for the Commonwealth's development and management of a national road system and the ongoing administration of a funding program through the provision of specific purpose payments. The specific administrative arrangements relevant to National Highways are outlined in the Notes on Administration Australian Land Transport Development Program 1992 (subsequently called Notes on Administration).

## Audit objectives

4. The ANAO undertook this performance audit to review the administration of the National Highway System Program by DTRS. The audit objectives were to: examine the efficiency and effectiveness of the departmental management of Commonwealth interests in the National Highway System; and identify improved administrative practices where possible.

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<sup>1</sup> A further \$556 million will be provided to local government and \$42 million for the Black Spot Safety Program.

## Audit conclusions

5. ANAO found that the actions taken by the Department during the course of the audit to update and improve the Notes on Administration and administrative processes, by commissioning various specialist studies and reviewing governance issues, has established a sound basis for ongoing effective management of the National Highway System. The Department advised ANAO that changes to the Notes on Administration reflect joint work done with the ANAO to identify where improvements could be made and incorporate not only suggestions and recommendations that the ANAO has made in the final report but also during the audit. ANAO considers that the comprehensive revision of the Notes on Administration undertaken by the Department should foster marked improvements in the management of the National Highway System.

6. ANAO made six recommendations identifying further opportunities for improvement in the effectiveness of Commonwealth management of the National Highway System. Specific areas identified where the Department may be able to make improvements include:

- enhancing the Department's focus on asset maintenance and improvement based on assessments having regard to appropriate initial design standards;
- assessing the feasibility of developing appropriate performance standards for the National Highway and reviewing the need to establish an appropriate data collection regime for performance information;
- making fortnightly payments to the States to better accord with effective Commonwealth cash management practices;
- improving the financial management information system to better monitor cost increases; and
- ensuring that expenditure categories complement the relevant legislation and enable whole of life analysis of investment options.

### *Program management*

7. When formal Ministerial Declaration of the National Highway System occurred in the mid-1980s, 17 locations were dual classified; that is, an existing temporary road alignment was defined along with an alternative permanent road alignment. ANAO advised the Department that some classification of these locations remain unresolved. The Department subsequently advised ANAO that it has reviewed the declarations of all the National Highways and that the Minister has revoked the earlier declarations and re-made declarations for all National Highways (except for the Sydney-Adelaide and Melbourne-Brisbane corridors where the existing declarations are still effective).

**8.** The Notes on Administration were compiled in 1992 and contain standards written in 1987 which refer to technical publications dating to the mid 1970s. In the course of the audit, the Department advised ANAO that it was aware that the Notes of Administration were out of date and convened an internal Task Force to review them. As a result, the Department subsequently submitted revised Notes on Administration to the Minister for approval. The revised Notes on Administration provide for improved administrative effectiveness in ensuring:

- greater departmental involvement in strategic planning and the specific provision for corridor planning studies at the strategic level;
- outlining principles for the maintenance performance agreements to link funding and condition once the ARRB–Transport Research work is complete and consultation with the States has taken place;
- making the distinction between maintenance and rehabilitation expenditure;
- improving data on the National Highway to be supplied by the States as requested;
- clarifying the Department’s requirements in relation to the information to be supplied at each stage of the development of a project from the initial concept to construction;
- updating of outmoded construction standards;
- revision of environmental clearance provisions to reflect new environmental assessment legislation; and
- ensuring financial completion of projects to finalise Commonwealth commitment.

**9.** ANAO considers that there would be merit in the Department providing an enhanced focus on maintenance of the National Highways asset by: evaluating the maintenance of levels of services on National Highways based on a detailed assessment of historical development funding levels, performance (including road condition), and forecasts of traffic growth; identifying the resources necessary to overcome major deficiencies which produce socially and economically unacceptable performance within a set time period; and evaluating the merits of National Highway upgrading of warranted projects based on a full assessment and having regard to design standards. The Department advised ANAO that it has agreed to consider the use of a warrants (needs) based analysis to develop its forward program and has asked ARRB–Transport Research to review the construction standards for the National Highway as a preliminary step to considering a warrants based analysis.

### *Financial management*

**10.** The ALTD Act specifies that amounts equal to the road user charge received by the Commonwealth shall be credited to the ALTD Account. The road user charge is a proportion of the amount of excise duty or customs duty, paid to the Commonwealth, in respect of motor spirit, or diesel fuel. If the Minister does not formally determine the charge rate, a default rate of 4.95 cents per litre applies. The Minister has not made a determination of the charge rate under Section 10 of the ALTD Act since 1993–94. ANAO estimates the amount available for expenditure from the ALTD Account pursuant to the ALTD legislation provisions would be some \$2.9 billion greater than that acknowledged by DTRS (see paragraph 3.4).

**11.** The Act also requires the Minister to report annually to Parliament on the details of the ALTD Account including moneys credited to and debited from the ALTD Account. The ALTD Program Annual Report prepared by DTRS has not provided details of the moneys credited to the ALTD Account and this would be beneficial in light of the changes to the accounting arrangements referred to above. The Department is currently reviewing the ALTD legislation and funding arrangements.

**12.** States are required to report monthly to the Commonwealth on the financial management of individual road projects, and if reports are not made, a portion or all of the monthly payment may be withheld. The Department pays the States monthly in advance, on or around the 22<sup>nd</sup> of each month. The monthly payment is based on an estimate of each State's likely expenditure over the forthcoming month. ANAO found that, following a peak of \$72.4 million in unspent payments in 1995–96, unspent payments steadily and significantly declined until 1998–99, when they increased to \$79.9 million. On average, the States held monthly surpluses during the year with the exceptions of the months of December and January. As a result of advance monthly payments to the States, the Commonwealth forfeited an estimated \$1.4 million in potential interest received in the period May 1999 to April 2000. ANAO estimated that, if Commonwealth payments to the States from May 1999 to April 2000 had been made fortnightly, instead of monthly in advance, the interest savings to the Commonwealth for the period would have been nearly \$0.8 million.

**13.** An effective financial management system should have in place procedures to promptly identify project cost changes. The early identification of budget over-runs and savings enables funds to be reallocated without the need for unnecessary provision of additional amounts. ANAO examined a sample of 40 completed projects to compare actual costs with the original estimates and of these 18 were over budget,

and 22 were within budget. The 18 projects that were over budget had total original estimated costs of \$175.7 million, and total actual costs of \$209.6 million, exceeding their estimated costs by about 20 per cent. The Departments' Roads Payment System (RPS) effectively identifies when a State has reached its expenditure limit for a particular project. However, the RPS does not report on how actual costs compare to the original estimated costs. ANAO suggests that the Department should revise the RPS to maintain the original estimated costs of approved projects, and report the original estimates in the annual ALTD progress report.

### *Asset management*

**14.** The process of road deterioration can be slowed significantly by effective asset management. This can extend the pavement life and ensure a safe and smooth travelling surface. ANAO considers that it is feasible for the Department to agree with each State the total sum required each year to maintain existing conditions. An agreed asset preservation program, breaking the task into components and then discussing and agreeing the separate needs of each component of an overall maintenance program, would result in better definition of roads funding needs. The Department commissioned a consultant to study the issue and develop a business case methodology for determining the appropriate level of funding to be allocated to maintaining the National Highway System. The Department is also currently working with the ARRB-Transport Research to develop a framework within which it can recommend decisions on maintenance funding based on needs analysis.

**15.** The National Highways construction standards (as defined in the Notes of Administration) require a new pavement design life of at least 20 years. The guidelines indicate minimum conditions that should apply to National Highways. The design life requirement of 20 years contrasts with advice from the States that they annually rehabilitate in the order of 1.5 to 2 per cent of the National Highway System, implying that continuation of this trend would lead to actual pavement lives having to be extended past 50 years. The Department advised ANAO that it keeps no records of pavement age to assist in planning and programming future rehabilitation expenditure. The absence of such data may inhibit the Department's capacity to monitor future service levels and investment needs.

**16.** The Department has Performance Agreements with the States to ensure the Commonwealth's maintenance funding is effectively used to produce the required outcomes. The States agree to maintain the National Highways with the funds provided and supply the Department with data on road condition. The ANAO's inquiries in relation to traffic count

data raised concerns about the accuracy of traffic volume counts that the Department was using for resource allocation decisions. The Department has always assumed reported counts would be made according to acknowledged standards; be consistent between States; and be comparable over time. A variety of problems were apparent in relation to the information provided to the Department. The procedures used to count traffic vary not only from jurisdiction to jurisdiction but sometimes within individual jurisdictions. In response to the data problem identified by ANAO, the Department commissioned a study by external consultants in October 2000.

17. The Maintenance Agreements with the States did not provide for significantly improved road conditions. The Maintenance Agreement with the States include performance indicators (by State) for the current three year period, which show no agreement-defined improvement in roughness but an actual commitment to a deterioration in road surface conditions in every State except for one State where no change has been agreed. ANAO could find no correlation between the performance indicators, the agreed road conditions to be achieved by the States and the annual funding allocation to be provided by the Commonwealth. The Department advised ANAO in October 2000 that it had commissioned the ARRB-Transport Research to undertake analysis of the condition of the National Highway in each State and to report on indicative funding levels to maintain and improve this condition. The Department noted that initial results from this work has been received and are being assessed prior to the Department undertaking consultation with the States.

18. The ANAO conducted a Data Envelopment Analysis (DEA), which is a linear programming tool, for benchmarking the performance of individual road links. The aim was to identify those links displaying best-practice performance and then develop a measure of the technical efficiency of the practices used as part of the management of each link. The average technical efficiency of the National Highway System maintenance program as a whole was assessed as up to 69 per cent. The lack of robust data was evident with traffic counts and the problem of mixing rehabilitation and maintenance expenditure was found to distort the findings of the ANAO's benchmarking study.

## Agency response

19. DTRS agreed with five recommendations and agreed with qualification to Recommendation No.3.

# Recommendations

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**Recommendation  
No.1  
Para. 2.33**

ANAO *recommends* that the Department of Transport and Regional Services enhance its focus on maintenance and improvement of the National Highways asset by:

- (a) evaluating the maintenance of levels of services on National Highways based on a detailed assessment of historical development funding levels, performance, and forecasts of traffic growth;
- (b) identifying the resources necessary to overcome major deficiencies which produce socially and economically unacceptable performance within a set time period; and
- (c) evaluating the merits of National Highways upgrading of warranted projects based on a full assessment and having regard to design standards.

***DTRS response:*** Agree.

**Recommendation  
No.2  
Para. 2.46**

ANAO *recommends* that the Department of Transport and Regional Services:

- (a) consults with relevant stakeholders to assess the feasibility of developing appropriate performance standards for the National Highway that can aid in assessing the need and time for new construction, rehabilitation and maintenance;
- (b) considers relating program objectives to identifiable corridor goals, link strategies, annual targets, program outcomes and agency performance measures, using States needs analysis information as appropriate; and
- (c) reviews the need to establish an appropriate data collection regime to ensure timely reporting to Ministers and Parliament against agreed performance measures.

***DTRS response:*** Agree.

**Recommendation No.3** ANAO *recommends* that the Department of Transport and Regional Services:

**Para. 3.10**

- (a) calculates an appropriate annual charge rate to enable the special appropriation to align with payments made under the ALTD Act, and advise the Minister accordingly;
- (b) prepares a formal determination of the charge rate for the Minister's consideration as provided for under Section 10 of the ALTD Act; and
- (c) reports the moneys credited to and debited from the ALTD Account in the ALTD Program Annual Report tabled in Parliament<sup>2</sup>.

***DTRS response:*** Agree with qualification

**Recommendation No.4** ANAO *recommends* that the Department of Transport and Regional Services considers moving to smaller

**Para. 3.22**

and more frequent payments to the States in line with better cash management practices.

***DTRS response:*** Agree.

**Recommendation No.5** ANAO *recommends* that the Department of Transport and Regional Services:

**Para. 3.30**

- (a) monitors estimated versus actual project costs as well as program based comparisons against States' budget allocations with States' total actual expenditure; and
- (b) revises the Roads Payment System to retain the original estimated cost of each approved project and report this in the annual ALTD progress report.

***DTRS response:*** Agree.

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<sup>2</sup> As required by Section 41(1) of the ALTD Act.



**Recommendation No.6**  
**Para. 4.24** The ANAO *recommends* that the Department of Transport and Regional Services appropriately defines National Highway expenditure categories to complement the legislation and facilitate whole of life analysis of investment options.

***DTRS response:*** Agree.



# **Audit Findings and Conclusions**



# 1. Introduction

## Background

1.1 The Commonwealth has funded the States and Territories (States) for road construction and maintenance since the 1920s. In 2000–01, the Commonwealth has budgeted to spend \$1.45 billion on roads (includes additional funding from the Roads to Recovery Program announced on 27 November 2000) of which the National Highway System (see Figure 1.1) will receive \$710 million and Roads of National Importance (RONIs) \$149 million.<sup>3</sup> The provision of funding takes the form of specific purpose grants under section 96 of the Constitution (tied grants) and general purpose grants (untied grants<sup>4</sup>).

**Figure 1.1**  
**National Highway System 2000**



Source: DTRS publication

<sup>3</sup> A further \$556 million will be provided to local government and \$42 million for the Black Spot Safety Program.

<sup>4</sup> Untied grant relate to funding provided by the Commonwealth for projects for which the Commonwealth has no direct control over beyond agreeing to the level of financing.

**1.2** In 1974, the then Commonwealth Government declared a series of capital city road links as National Highways. At that time the National Highways System comprised a 16 000 km network that was a patchwork of roads ranging from outback dirt tracks to four-lane, dual carriageways, sealed highways (including 646 km of four-lane divided and 11 850 km of two-lane sealed road) and 3807 km of gravel road<sup>5</sup>. In the early 1970s, only 73 per cent of the National Highways had been sealed. This rose to 88 per cent by 1981. Sealing of the National Highway System was completed in 1989. In the decade since then, various categories of upgrading have continued, including widening narrow two lane sections to permit safer use by road trains and providing three lane sections to permit safer overtaking. In 2000, the Sydney to Canberra link became the first interstate capital city corridor to be fully dual carriageway.

**1.3** The National Highway System comprises the ‘principal’ road corridors between each State capital city plus between Brisbane and Cairns, Hobart and Burnie and urban links within Brisbane, Perth, Sydney, Melbourne and Adelaide<sup>6</sup>. Additions to the network were made in 1992, including Melbourne-Brisbane and Sydney-Adelaide and provision for urban link roads. Figure 1.2 identifies the 12 corridors (and the five urban links) and depicts the length of each corridor, which range from 123 km for the Canberra Connectors (the Federal and Barton Highways) to 3696 km on the Perth to Darwin link.

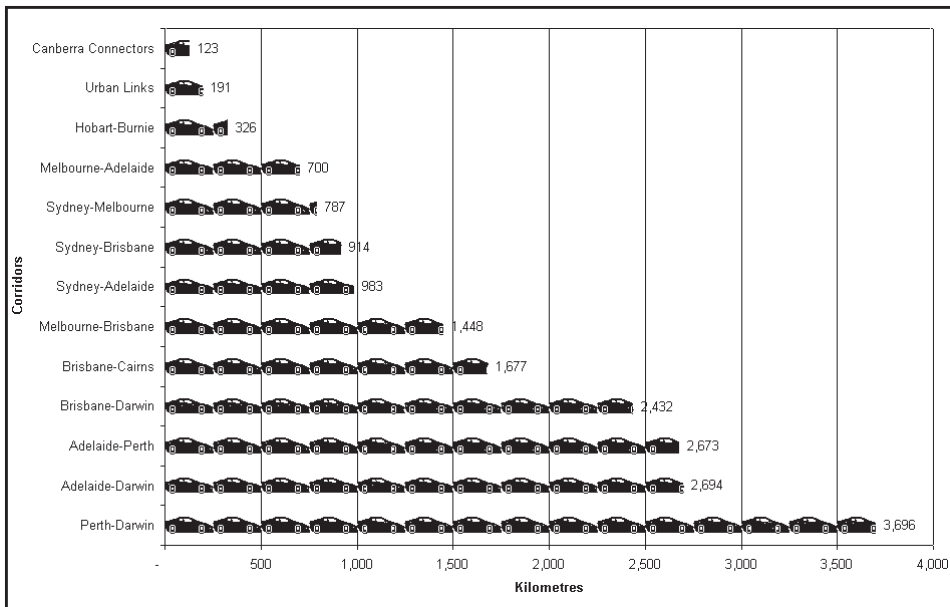
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<sup>5</sup> *The Length of the Land Australia's National Highway*, DTRS, 1993.

<sup>6</sup> The National Highway network comprises:

- New South Wales: the Hume, New England, Sturt and Newell highways, the F3 Freeway and the Cumberland Highway/Pennant Hills Road urban link from the Crossroads at Liverpool to Hornsby. National Highway connections to Canberra are via the Federal and Barton highways;
- Victoria: the Goulburn Valley Highway, the Hume and Western highways and that portion of the Melbourne Western Ring Road that connects them, and part of the Sturt Highway;
- Queensland: the Bruce Highway on the Brisbane-Cairns link, parts of the Cunningham and New England highways on the Sydney-Brisbane link, the Warrego, Gore and Leichardt (part) highways on the Melbourne-Brisbane-Darwin link. The cross-city National Highway link incorporates the Ipswich Motorway, Granard Road, Riawena Road, Kessels Road, Mt Gravatt-Capalaba Road and the Gateway Motorway excluding the Gateway Bridge;
- Western Australia: the Eyre, Coolgardie-Esperance and Great Eastern highways on the Adelaide-Perth link and the Great Northern and Victoria highways on the Perth-Darwin link. In Perth, the National Highway link comprises the Roe Highway from its intersection with the Great Eastern Highway to its junction with the Great Northern Highway;
- South Australia: the Sturt Highway, the South-Eastern Freeway, the Adelaide-Port Augusta Road, the Eyre and Stuart highways and the cross-city connector defined by Portrush Road, Lower Portrush Road, Ascot Avenue, Hampstead Road, Grand Junction Road and Main North Road;
- Tasmania: the Bass Highway from Burnie to Launceston and the Midland Highway from Launceston to Granton in the northern suburbs of Hobart;
- Northern Territory: the Stuart, Barkly and Victoria highways; and
- Australian Capital Territory, the Federal and Barton highways.

**Figure 1.2**  
**National Highway System Corridor Lengths**



Source: ANAO from data supplied by State and Territory Road Authorities

**1.4** National Highway funding comprises new construction to accommodate increased usage; maintenance of existing roads; and rehabilitation of existing roads. In the triennium to 1998–99, an estimated \$2.5 billion had been invested by the Commonwealth in the National Highway System and RONIs with 46 per cent of funds being allocated to National Highway construction, 34 per cent to National Highway maintenance, 13 per cent to RONIs and 7 per cent to safety, urgent and minor works projects undertaken on the National Highway System.

**1.5** Eighty per cent of all Australians live within 40 km of a part of the National Highway System. This plays a significant role in the efficient movement of goods. The National Highway System carries an estimated 15 per cent of all vehicles in Australia, particularly heavy transports, which on some sections comprise half the traffic stream. Heavy usage of National Highways came at the cost of over 3600 injury accidents and 237 fatalities in 1998.

**1.6** Some \$14 billion of Commonwealth funds in total has been spent since 1974 when the Commonwealth first declared that it would fund the National Highways System. In order to maintain the service standard of the National Highways, regular maintenance is required to keep them in good order and to avoid structural failure. The need for maintenance will be influenced by the existing condition of the road and factors such as weather, ground conditions (for example, salinity) and traffic volume and type.

1.7 In recognition of the need to develop key routes with national benefit outside the national roads category, funds have been made available for RONIs since 1996. This category broadens the criteria<sup>7</sup> under which roads qualify for funding. The RONIs program projects to June 2000 involve approved funding of some \$1.3 billion and are listed at Figure 1.3.

**Figure 1.3**

**Roads of National Importance Projects: June 2000**

<i>State</i>	<i>Project</i>	<i>Length km</i>	<i>Approved Funding \$ m</i>
<b>NSW</b>	• Pacific Highway from Hexham (Newcastle) to Qld border—multiple projects	700.0	600.00
	• Kidman Way sealing	150.0	20.70
	• Summerland Way	180.0	20.00
	• Nowra—Braidwood Rd (Main Road 92)		34.00
	• Tumut Forest Roads		5.00
	• Great Western Hwy—Penrith to Bathurst	137.0	100.00
<b>QLD</b>	• Pacific Hwy—Qld Border to Brisbane	43.0	150.00
	• Upgrade road link to Port of Gladstone	19.0	6.00
	• Upgrade road link to Port of Brisbane	16.3	44.00
<b>VIC</b>	• Calder Freeway	500.0	75.10
	• Princes Hwy—Pakenham Bypass	19.0	30.00
	• Geelong Road	48.0	120.00
<b>WA</b>	• Goldfields Highway	82.0	15.00
	• Mitchell Freeway	2.6	25.00
<b>SA</b>	• Gillman Highway	5.0	18.50
<b>TAS</b>	• Devonport Port Access	0.4	1.07
<b>NT</b>	• Tiger Brennan Drive	5.4	2.50
<b>Total</b>			<b>\$1266.9</b>

Source: ANAO analysis from information supplied by DTRS

1.8 Funds are provided for eligible construction projects generally on a 50:50 cost-sharing basis between the Commonwealth and the relevant State. Eligible RONI projects are expected to improve links to major centres of economic activity; improve links to the National Highways or major transport facilities and allow people and goods to move more freely within population centres. Projects are expected to form part of integrated transport and land use studies; promote improvements in safety, efficiency and reliability, including the use of new transport technologies; contribute to achievement of environmental targets; and produce net economic benefits.

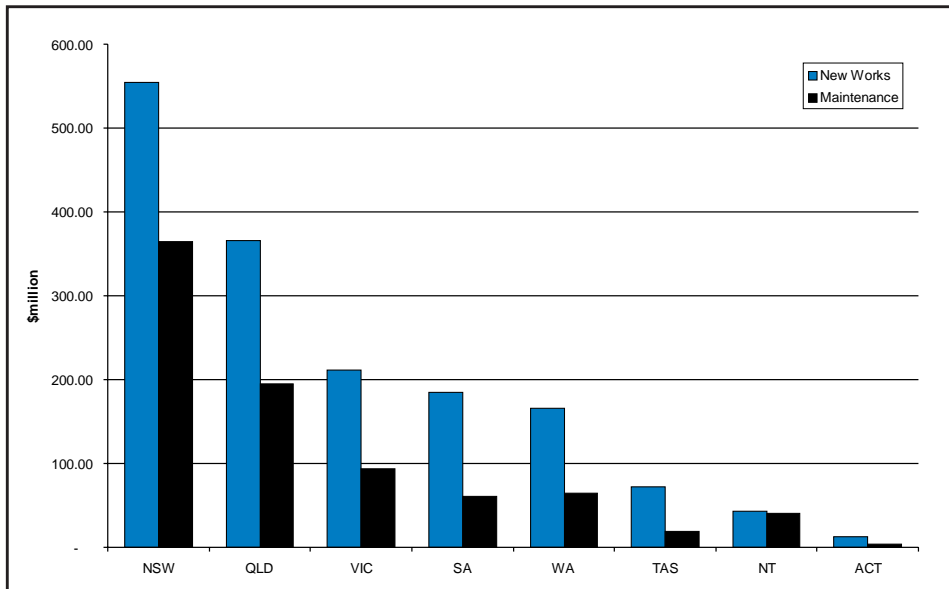
<sup>7</sup> The *ALTD Act* requires selected national arterial projects to demonstrate that the benefits likely to flow from the construction of the road, or proposed road, justify the incurring of the costs of construction.



**1.9** National roads funding to each State is outlined in Figure 1.4. New South Wales and Queensland account for almost 60 per cent of the new works and two-thirds of the maintenance funding. These two States accounted for almost 60 per cent of total vehicle kilometres on the National Highways. The ratio of new works to maintenance expenditure is the highest in Tasmania and the lowest in the Northern Territory.

**Figure 1.4**

**National roads funding for new works and maintenance for the triennium 1998–99 by State (including National Highway System and RONIs)**



Source: Figures supplied by the DTRS

## Administrative framework

**1.10** The Department of Transport and Regional Services (DTRS) provides policy advice to the portfolio Ministers and delivers a range of programs and services on behalf of the Commonwealth Government. The administration of the National Highway System and RONI programs involves the development of a five year forward strategy, assessing States nominated projects and advising the Minister on priorities for competing funding applications<sup>8</sup>.

<sup>8</sup> For 1999–2000, the Department's specific responsibilities relating to policy and the provision of road infrastructure included: a review of the national roads objectives; the development of a business case for funding of maintenance on the NHS; and the development of a bridge upgrading program.

**1.11** The national roads programs administered by the Department are the National Highways and RONIs programs. These programs have involved the Commonwealth funding States in recent years in the order of \$800 million annually through specific purpose payments for national roads. The funding was provided for all construction and maintenance of the National Highway System and the construction only of a number of RONIs<sup>9</sup> in the States, generally matching State funding on a dollar for dollar basis.

**1.12** The legal framework comprising the Constitution, the *Finance and Management Accountability Act 1997* (FMA Act) and the *Australian Land Transport Development Act 1988* (ALTD Act) provide the basis for the Department to provide advice to the Minister for Transport and Regional Services and to administer road funding to the States. This involves interaction with Commonwealth central agencies and the States' Ministers for Transport and their respective agencies. Stakeholders are consulted through a number of mechanisms, including the Australian Transport Council and the National Road Transport Commission.

**1.13** The ALTD Act provides the legislative framework for the Commonwealth's development and management of a national road system and the ongoing administration of a national roads funding program through the provision of specific purpose payments. The specific administrative arrangements relevant to Commonwealth national roads and funding are outlined in the Notes on Administration Australian Land Transport Development Program 1992 (thereafter called Notes on Administration).

**1.14** The Department advised the House of Representatives Standing Committee on Communications, Transport and Microeconomic Reform (HORSCCTMR) Inquiry, in 1997, that the Commonwealth had identified objectives for the National Highway System, as: facilitated overseas and interstate trade and commerce; allowed safe and reliable access by a significant proportion of Australians to major population centres; minimised the cost of the National Highway System to the Australian community; supported regional development; and contributed to ecologically sustainable development.

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<sup>9</sup> The label 'Road of National Importance' is commonly substituted for 'National Arterial' which is the term formally defined under the ALTD Act to refer to this class of roads.

## Audit approach

**1.15** Since 1989, there have been three performance audits and four Parliamentary inquiries into aspects of the Commonwealth's involvement in roads programs<sup>10</sup>. The reviews considered the objectives and management of a range of Commonwealth and State road programs and recommended various changes. Those affecting DTRS included recommendations to:

- redefine and formalise in legislation the objectives of the National Highway System;
- focus on achieving national objectives;
- develop national priorities to ensure the relative needs of all sections of the National Highways are assessed;
- develop, publish and implement an integrated strategic plan for the national transport network by 1 July 1999;
- implement asset management practices for the National Highways covering long term planning, pavement evaluation, usage analysis and funds management;
- introduce greater certainty in road funding; and
- improve performance management of its specific purpose payments for the National Highways program.

**1.16** Many of these recommendations were made by the House of Representatives Standing Committee on Communications, Transport and Microeconomic Reform in its report *Planning not Patching*. The Government responded to this report in April 2000 accepting most of the recommendations.

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<sup>10</sup> Auditor-General Audit Report 1989: *Department of Transport and Communications: Commonwealth Road Funding Programs—the National Highway*; Auditor-General Audit Report No.15, 1993–94: *Transport and Communications portfolio: The National Highway 'Lifeline of the Nation'*; Auditor-General Audit Report No. 31, 1998–99: *The Management of Performance Information for Specific Purpose Payments—The State of Play*; *Inquiry into the Efficiency of Road Construction and Maintenance: Driving the Road Dollar Further*, report from the House of Representatives Standing Committee on Transport, Communications and Infrastructure (HORSCOTCI), December 1993; *Planning not Patching: An Inquiry into Federal Road Funding*, report from HORSCOTCI, October 1997; *The Administration of Specific Purpose Payments: A focus on outcomes*, Report 362 from the Joint Committee of Public Accounts (JCPA), November 1995; and *General and Specific Purpose Payments to the States*, Report 362 from the Joint Committee of Public Accounts and Audit (JCPAA), June 1998.

**1.17** The ANAO undertook this performance audit to review the administration of the National Highway System Program by DTRS. The audit objectives were to: examine the effectiveness and efficiency of departmental management of Commonwealth interests in the National Highway System; and identify improved administrative practices where possible. The audit scope does not extend to other road programs administered by the Department.

**1.18** ANAO's methodology for the audit involved: review of departmental records and discussion with personnel; discussions with State and Territory road authorities, industry bodies and agencies with responsibilities for national roads research; review of literature and international good practice in roads management; and benchmarking, using econometric modelling techniques. The audit did not include a review of the application of Commonwealth funds for specific project payments but relied on State and Territory certification processes. ANAO's fieldwork was conducted between March 1999 and June 2000. ANAO engaged Dr John Whiteman to advise on econometric techniques to benchmark road maintenance efficiency. The audit was concluded in accordance with ANAO Auditing Standards at a cost to the ANAO of \$415 000.

## 2. Program Management

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### Administrative framework

**2.1** National Highways System projects reflect a cascade of strategic planning and project programming decisions that underpin the progression of each project from its conception through development of options, planning studies, funding, design and construction. The typical road project involves a series of events beginning with the identification of a transport need, placing this in the context of network planning considerations, developing alternatives, and studying the likely benefits, costs and impacts of each of these until there is definition of an overall project concept. A project is not instituted until it has emerged from this needs analysis and concept identification process and has been selected for inclusion in a forward strategy (or works) program. Planning studies, including feasibility and environmental impact assessments, may then be considered for funding as the next stage in the development of the project<sup>11</sup>.

**2.2** The States are required to submit a Forward Strategy Report by 31 December each year to form the basis of discussions with the Department to develop a National Highways plan for endorsement by the Minister. This set out the estimated costs and (five year) expenditure timeframes for all proposed road works and are supported by reports that show the condition of the road, describe maintenance and upgrading strategies and how the proposed strategy fits in with the rest of the National Highway System and the surrounding road network.

**2.3** After the Commonwealth Budget, generally in May, the Minister formally advises each State of the allocation for the coming financial year. This is the Commonwealth's formal response to the State's Forward Strategy submission. The Department does not advise the States of the acceptability of their Forward Strategy submissions. The Department advised ANAO that the latter is a matter for the Minister.

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<sup>11</sup> Queensland Transport's Total Project Cost Control Guidelines indicate a two stage budget process that flows down from the:

- *Strategic/Concept phase* conducted within the network planning budget process. This starts with a Transport Infrastructure Strategy involving network/link level planning and then Identification of Projects within a timetable. The next stage is Project Concept Development involving estimation of Project Costs and Benefits and this is followed by documentation of a Project Justification and Budget. These activities precede the:
- *Planning and Preliminary Design phase* (and subsequent activities) funded under a project budget approval process.

**2.4** In recommending to the Minister the ongoing and new construction works program, the Department assesses the future needs and requirements of each major National Highway corridor, taking into account: the strategy for that corridor; traffic volumes, both current and projected; safety issues and crash history; the nature and type of vehicle using the corridor; the presence and amount of freight moved; and the type of industry served by each corridor. The Department did not have a comprehensive information database from which it could independently assess these factors. The Department advised ANAO that, while it does not have the information in a database, the latter is available for assessment purposes from files and the corridor strategies. Improvement in the management of the documentation process could enhance the assessment process for new investment and monitoring of whether previous investments have proved to be worthwhile and whether further upgrades are warranted.

### **Notes on administration**

**2.5** The ALTD Act provides for the Minister to invite or direct a State to submit particulars of projects for the construction of National Highways or of national arterial roads<sup>12</sup>. Elements of the Notes of Administration relating to planning include the following:

- **Forward Strategy Reports**—a flexible planning document which each State is to submit by 31 December each year to form the basis of discussions with DTRS to develop a NHS plan for endorsement by the Minister. The Report is to set out all proposals for the next financial year plus four subsequent years, the estimated costs and proposed timeframe for expenditure.
- **Scope of Major Projects**—should normally encompass all works required without the need for further submissions including staging to allow progressive opening to traffic. The Minister may, after consultation with a State, aggregate or disaggregate works for approval as appropriate.
- **Staged Approval for Major Projects**—includes identifying projects and preparing cost estimates.
- **Standards**—guidelines are issued for both construction and maintenance—the proposed standard should be appropriate for the particular project.

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<sup>12</sup> ALTD Act 1988 Sect 26.

**2.6** The Notes on Administration set out the procedures that the Department and State Road Authorities are to follow for the development of new works projects. The Notes on Administration detail the processes required for payment of funds to the States on the basis that a report is provided on past and projected expenditure; competitive tendering for National Highway projects (exemptions may be granted); project approval stages necessary for each roads, projects; and Ministerial approval process for expenditure of public money.

**2.7** The Notes on Administration were compiled in 1992 and contain standards written in 1987 which refer to technical publications dating to the mid 1970s. In the course of ANAO fieldwork, the Department advised that it was aware that the Notes of Administration were out of date and convened an internal Task Force to review them. As a result, the Department has submitted revised Notes on Administration to the Minister for approval.

**2.8** ANAO considers that the comprehensive revision of the Notes on Administration undertaken by the Department should foster improvements in the management of the National Highway System. The Department advised ANAO that the revised Notes on Administration aim to:

- provide for greater departmental involvement in strategic planning and the specific provision for corridor planning studies at the strategic level;
- provide for principles for the maintenance performance agreements to link funding and road condition once the ARRB–Transport Research work is complete and consultation with the States has taken place;
- make the distinction between maintenance and rehabilitation expenditure clear in accordance with the definitions in the legislation;
- meet the recommendations of the House of Representative report *Planning not Patching* to incorporate the objectives of the National Highway and the RONI guidelines into the Notes on Administration;
- streamline the procedure of tender approvals in line with the Commonwealth’s competition policy framework;
- provide for data on the National Highway to be supplied by the States as requested;
- clarify the Department’s requirements in relation to the information to be supplied at each stage of the development of a project from the initial concept to construction to support the funding decision the Commonwealth is being asked to make, including a requirement to specify the basis of estimates of the cost;

- update outmoded construction standards;
- consolidate State reporting requirements and include reporting on additional requirements such as application of the National Code of Practice for the Construction Industry;
- revise environmental clearance provisions to reflect new environmental assessment legislation;
- provide for financial completion of projects to finalise Commonwealth commitment;
- update the Notes on Administration to reflect current procedures; and
- ensure State expenditure claims are net of Goods and Services Tax.

**2.9** The Department advised ANAO that:

*The Department has been reviewing for some time the Notes on Administration with a view to their consolidation, as although the Minister has made amendments from time to time, they no longer accurately reflected current practices and procedures. There were also a number of policy changes that the Department wished to reflect in the Notes on Administration. The review was put on hold while the ANAO carried out its performance audit of the Roads Program, to allow the results of the audit to be incorporated into the review. This has now occurred, and the proposed changes set out [above] reflect joint work done with ANAO to identify where improvements could be made. A number of the changes therefore reflect not only suggestions and recommendations which the ANAO has made in the final report but also during the audit.*

*Together with the recently revised payments system which the Department has introduced to achieve more accurate accounting of States' reported expenditure and payments at the project level, the revisions to the Notes on Administration are designed to streamline the administration of the program in line with the legislation and Commonwealth policies.*

**2.10 Finding:** The Notes on Administration were compiled in 1992 and contain standards written in 1987 which refer to technical publications dating to the mid 1970s. In the course of the Audit, the Department advised ANAO that it was aware that the Notes of Administration were out of date and convened an internal Task Force to review them. As a result, the Department has submitted revised Notes on Administration to the Minister for approval.

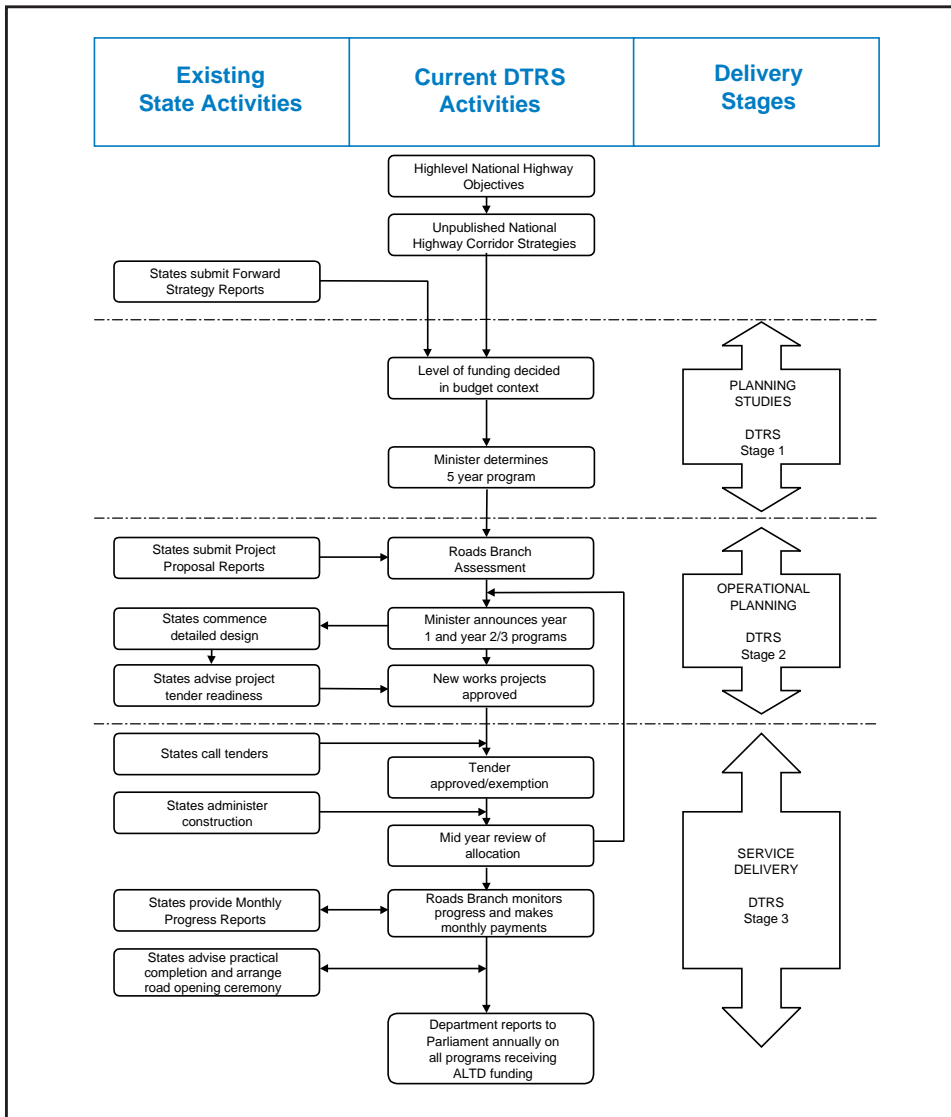


**2.11** The Department advised that changes to the Notes on Administration reflect joint work done with the ANAO to identify where improvements could be made and incorporate not only suggestions and recommendations that the ANAO has made in the final report but also during the audit. ANAO considers that the comprehensive revision of the Notes on Administration undertaken by the Department should foster improvements in the management of the National Highway System.

## Project approval

**Figure 2.1**

**Administrative framework for National Highways System management.**



Source: ANAO based on DTRS ALTD Notes on Administration

**2.12** The Notes on Administration requires that National Highway projects normally be considered in three stages (see Figure 2.1) as follows:

- stage 1 comprises the development of the States' Forward Strategies with the Minister first endorsing (but does not approve) selected projects which are listed in a three year rolling program and classified as having Stage 1 status;
- pre-construction design and project documentation activity occur during Stage 2, which qualify for Commonwealth funding after Ministerial approval; and
- after the Minister, generally in the Budget context, announces availability of funds, the Construction phase—Stage 3 commences. During Stage 3, the Department monitors construction progress and pays States' monthly progress claims.

**2.13** The Department's 1998–99 *National Highway Corridor Strategies* document identified 79 projects representing almost \$4 billion in future construction costs that have forward or future program status<sup>13</sup> (see Figure 2.2). In addition, the Department is aware of another 27 major projects representing \$2.3 billion possible future construction costs on which the Commonwealth has expended over \$58 million on planning studies and land acquisition.

**Figure 2.2**

**DTRS Corridor Investment Program in 1998–99**

<i>Forward program</i>	<i>Number of projects</i>	<i>Estimated construction cost (\$b)</i>
• DTRS Forward/Future Programs	79	3.993
• DTRS Planning Studies Schedule only	27	2.349
<b>Total identified in DTRS Program</b>	<b>106</b>	<b>6.342</b>
• plus States' Forward Strategy Report submissions not in DTRS program	73	1.839
<b>TOTAL PROJECTS IDENTIFIED</b>	<b>179</b>	<b>8.181</b>

Source: ANAO analysis of data supplied by DTRS

**2.14** Of the 106 projects identified in the Department's 1998–99 programs, 58 are proposed major projects, defined as having planning studies (or proposals) for major works exceeding an estimated \$10 million construction cost where new alignments are an option. In total, these

<sup>13</sup> The forward program represents an approximate 1–3 out years timeframe. The future program covers a longer timeframe.

represent a 'potential commitment' for over \$4.6 billion of new work construction that are the subject of Commonwealth funded planning studies.

**2.15** The 1998–99 States' Forward Strategy reports submitted to the Department identified the projects that did not have Commonwealth recognition of some form. There were 73 of these projects representing \$1.84 billion in possible future construction costs (see Figure 2.2). The Department advised ANAO that planning at the State level is often undertaken independently of the Commonwealth but, even where National Highways are involved, planning using State funds does not commit the Commonwealth to the planning outcome or to construction. Unapproved expenditure by the States on land acquisition does not constitute a commitment by the Commonwealth. DTRS has no data on amounts expended by the States on this activity.

**2.16** ANAO requested clarification from DTRS regarding the status of the Notes on Administration traffic levels of service standards for the National Highways, the relative weights attached to the various standards and their relationship with apparent intervention levels or warrants for upgrading in accordance with established professional practice and research. The Department advised ANAO that it does not treat the Notes on Administration service standards as intervention criteria for remedial works and the fact that a particular section of road does not meet these standards is not in itself a justification for work to be undertaken.

**2.17** The Department is currently managing an Austroads project to develop a multi-criteria evaluation model for the assessment of National Highway projects. This research project may improve the transparency and accountability of the Department management of national roads programs.

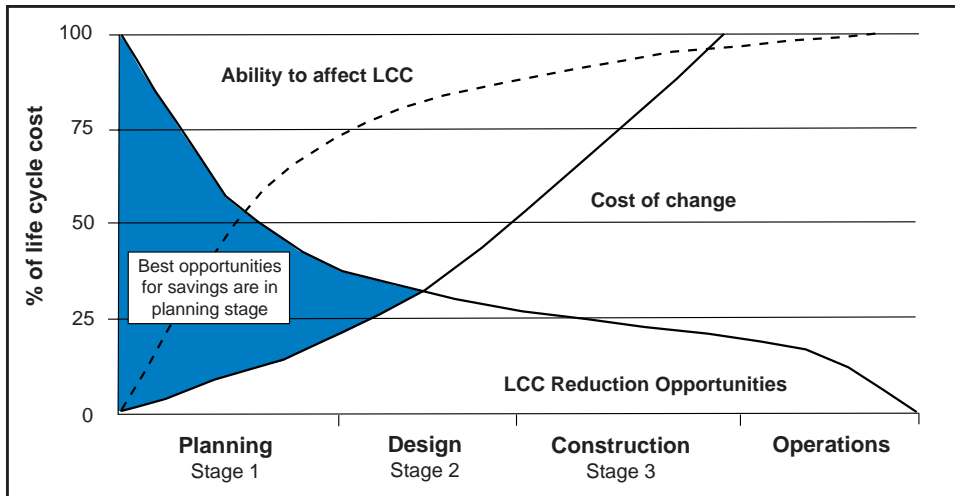
**2.18 Finding:** The Department's *1998–99 National Highway Corridor Strategies* document identified 79 projects representing almost \$4 billion in future construction costs that have forward or future program status. The 1998–99 States' Forward Strategy reports submitted to the Department identified the projects that did not have Commonwealth recognition of some form. There were 73 of these projects representing \$1.84 billion in possible future construction costs. The Department advised ANAO that planning at the State level is often undertaken independently of the Commonwealth but, even where National Highways are involved, planning using State funds does not commit the Commonwealth to the planning outcome or to construction. Unapproved expenditure by the States on land acquisition also does not constitute a commitment by the Commonwealth. DTRS has no data on amounts expended by the States on this activity.

**2.19** The Department is currently managing an Austroads project to develop a multi-criteria evaluation model for the assessment of National Highway projects. This research project may improve the transparency and accountability of the Department management of national roads programs.

## Planning framework

**2.20** The planning process for a complicated National Highway project can take up to five years. ANAO reviewed the delivery process of a number of projects and considers that the Department could improve its effectiveness by becoming more involved in Stage 1 planning study activity. Figure 2.3 indicates that it is in the early stages of project development that the greatest opportunities exist for achieving life cycle cost reduction and therefore overall benefits to the Commonwealth.

**Figure 2.3**  
Life cycle cost (LCC) reduction opportunities



Source: Institute of Municipal Engineering Australia—National Asset Manual

**2.21** When formal Ministerial Declaration of the National Highway System occurred in the mid-1980s, 17 locations were dual classified; that is, an existing temporary road alignment was defined along with an alternative permanent alignment.<sup>14</sup> ANAO advised the Department that some of these locations remain unresolved. For example, there are unresolved situations in the Lower Hunter (the Newcastle hinterland)

<sup>14</sup> The Declaration Instrument states 'A section will cease to be declared when the corresponding section of permanent alignment is opened to through traffic.'

and at Broadmeadows (for the Craigieburn Bypass on the outskirts of Melbourne). The Department subsequently advised ANAO that it has reviewed the declarations of all the National Highways and that the Minister has revoked the earlier declarations and re-made declarations for all National Highways (except for the Sydney-Adelaide and Melbourne-Brisbane corridors where the existing declarations are still effective).

**2.22** The Department could improve the outcome for the Commonwealth by giving enhanced attention to strategic planning issues. In particular, ANAO raised with the Department whether there would be benefits in dividing the procedures in the current Stage 1 (see Figure 2.1) into two parts or stages comprising a Strategic (Corridor) Planning stage; and a revised Stage 1 (Project) Planning Studies stage.

**2.23** The Strategic Planning stage could involve negotiations between the Commonwealth and States regarding overall National Highway objectives. This could also involve and reviewing the development of corridor strategies including the Planning Studies stage which could embrace implementation of the Corridor Strategies and precede the current detailed Project Proposal Reports that States submit to the Department as the first notification of an intended project. The outcome of this could involve a project planning report, preliminary design drawings and a cost plan. The Department advised ANAO in October 2000 that it has reviewed and revised the Notes on Administration to provide for the funding of strategic planning studies on a corridor basis. The Department considers that this funding can be accommodated within the existing Stage 1 category rather than by the creation of additional categories of project.

**2.24** After completion of Stage 1, the Commonwealth could still control the commencement of Stage 2—Pre-Construction activity through the corresponding Ministerial announcements confirming the priority of the project and including it in the three year rolling program with approval of funding for Stage 2. After that, the Commonwealth could determine the commencement of construction (Stage 3) by announcing the availability of construction funds.

**2.25** Management of the States' design and construction activities during Stages 2 and 3 could focus more on monitoring if the project has been sufficiently well defined and costed in the Preliminary Design work and an appropriate performance agreement has been signed with the responsible State Road Authority. This approach could involve the Department streamlining its current role in Stage 3 and increasing its efforts. This would require the Department to amend the Notes on

Administration to include procedures for a new Stage 4 to properly finalise, acquit and report annually on each Planning Study, new works construction project and maintenance program. The Department advised ANAO in October 2000 that the revised Notes on Administration provide for financial completion of a project and that the Department has agreed to expand its current ALTD report to cover planning studies. The Department further advised ANAO that the 1998–99 report, which will be published shortly, contains a section on the maintenance outcomes for the National Highway and that the Department proposes to continue to report on this. The Department noted that the ALTD reports currently provide expenditures details for construction projects.

**2.26** In the course of the audit, ANAO identified the need for the Department to establish a new administrative stage to provide for reporting of the finalisation and acquittal of each planning study, new works project and maintenance program. The Department advised that it considers possible options for staging of projects and the States are also aware that a project that cannot be staged is likely to cost more and so is less likely to be able to be funded within current appropriations. The Department also advised ANAO that it has recently amended the Notes on Administration to require project proposal reports to canvass staging options and provide annual procedures for reporting of the finalisation and acquittal of projects.

**2.27 Finding:** When formal Ministerial Declaration of the National Highway System occurred in the mid-1980s, 17 locations were dual classified; that is, an existing temporary road alignment was defined along with an alternative permanent alignment.<sup>15</sup> ANAO advised the Department that some of these locations remain unresolved. For example, there are unresolved situations in the Lower Hunter (the Newcastle hinterland) and at Broadmeadows (for the Craigieburn Bypass on the outskirts of Melbourne). The Department subsequently advised ANAO that it has reviewed the declarations of all the National Highways and that the Minister has revoked the earlier declarations and re-made declarations for all National Highways (except for the Sydney-Adelaide and Melbourne-Brisbane corridors where the existing declarations are still effective).

**2.28** The planning process for a complicated National Highway project can take up to five years. In the course of the audit, ANAO identified the need for the Department to establish a new administrative stage to

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<sup>15</sup> The Declaration Instrument states 'A section will cease to be declared when the corresponding section of permanent alignment is opened to through traffic.'

provide for reporting of the finalisation and acquittal of each planning study, new works project and maintenance program. The Department advised ANAO that it has recently amended the Notes on Administration to require project proposal reports to canvass staging options and provide annual procedures for reporting of the finalisation and acquittal of projects.

## Resource allocation

**2.29** In 1984, the Bureau of Transport Economics (BTE) in its '*Assessment of the Australian Road System—Report 56*' suggested an approach to resource allocation analysis based on a three-step process that determines the funding needed:

- firstly, to keep the existing system going;
- secondly, to keep pace with existing traffic growth and maintains existing levels of service; and
- thirdly, to upgrade facilities to provide a higher level of service where economically justified (whether this be increased safety or speed, or reduced noise levels or operating costs, for example.)

**2.30** A resource allocation framework that had regard to the above mentioned approach, could assist in providing advice to the Government on the allocation of funds. ANAO considers that there would be merit in the Department providing an enhanced focus on assessing and guiding outlays to ensure that the Commonwealth achieves sound outcomes by:

- evaluating the maintenance of services on National Highways based on a detailed assessment of historical development funding levels, performance (including road condition), and forecasts of traffic growth;
- identifying the resources necessary to overcome major deficiencies which produce socially and economically unacceptable performance within a set time period;
- evaluating the merits of distributing residual funds to National Highway upgrading of warranted projects based on a full assessment and having regard to design standards; and
- continuing to rank projects based on incremental benefit-cost analysis.

**2.31** In 1997, BTE Working Paper 35 titled *Roads 2020* only forecast at a strategic level of expenditure needs for National Highway System investment and maintenance up to the year 2020. The report identified economically warranted construction expenditure of \$7 billion is needed to widen relevant highways to meet projected population growth. Maintenance needs to 2020 were estimated at about \$8 billion and bridge upgradings costing over \$500 million were also identified.<sup>16</sup>

**2.32 Finding:** ANAO considers that there would be merit in the Department providing an enhanced focus on asset maintenance by: evaluating the maintenance of services on National Highways based on a detailed assessment of historical development funding levels, performance (including road condition), and forecasts of traffic growth; identifying the resources necessary to overcome major deficiencies which produce socially and economically unacceptable performance within a set time period; and evaluating the merits of distributing residual funds to National Highway upgrading of warranted projects based on a full assessment and having regard to design standards.

## Recommendation No.1

**2.33** ANAO *recommends* that the Department of Transport and Regional Services enhance its focus on maintenance and improvement of the National Highway asset by:

- (a) evaluating the maintenance of levels of service on National Highways based on a detailed assessment of historical development funding levels, performance, and forecasts of traffic growth;
- (b) identifying the resources necessary to overcome major deficiencies which produce socially and economically unacceptable performance within a set time period; and
- (c) evaluating the merits of National Highway upgrading of warranted projects based on a full assessment and having regard to design standards.

**2.34** Department of Transport and Regional Services' response: Agree.

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<sup>16</sup> The BTE report excluded consideration of urban roads, flood immunity works, widening for road trains, major realignments and not economically justified community service projects.



## Network outcomes

**2.35** The Department advised HORSCCTMR in 1997 that it has no formal mechanism to regularly review the continuing appropriateness of the existing National Highway System, or what links should be added or deleted from the system to meet changing economic needs. This situation continued to prevail at the time of the audit. The Department does not make submissions or provide formal input to State Planning processes, rather, States submit their Forward Strategy and Project Proposal Reports to the Department. This presumes the State has understood and properly considered the national interest, National Highway System objectives and corridor goals in its planning process. This may be more easily achieved in rural locations but in the high cost and heavy traffic urban and urban-outskirts locations this may be a larger problem.

**2.36** ANAO noted for example, that consistency of standards at ‘border’ areas such as on the Hume Highway linking Sydney and Melbourne there are four freeway lanes in Victoria yet 81km of two way two lane sections remain in New South Wales and most of the remainder is only dual carriageway rather than freeway standard. The Department advised ANAO that many of the projects on this link had lower economic justification than other projects on the National Highway work program. However, the Department also advised that the Minister has recently reaffirmed that the Sydney-Melbourne corridor as the next National Highway priority, specifically the freeway extension beyond Bookham.

**2.37** The Minister for Transport and Regional Services announced a series of road network funding objectives in the 1998–99 Budget Statements that defined 14 outcomes<sup>17</sup> anticipated to be achieved during the next 10 years. At the same time, the Department developed a series National Highway corridor strategies that outlined existing conditions; deficiencies; short, medium and long term needs; and listed works identified in forward and future programs to implement this strategy. Performance measures for road network funding objectives and the corridor strategies are not contained in the National Highways System program objectives.

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<sup>17</sup> These were: Freeway conditions west of Brisbane to Toowoomba; four-lane divided highway: Ballarat to Brisbane (mostly), Burnie to Devonport, Canberra to Sydney, Melbourne to Bendigo (mostly), beyond Cooroy on the Sunshine Coast; narrow-sealed sections eliminated and most of rural network open to B-doubles; road trains possible from Toowoomba to Darwin and to outskirts of Adelaide, Brisbane and Perth; Sealed roads: Kidman Way, Kalgoorlie to the Pilbara; reconstruction of: Summerland Way, 50km of highway north of Perth, 379km of the Great Eastern Highway, 720km of the Eyre Highway; widening and improvements to the Great Western Highway over the Blue Mountains; bypass of Northam.

**2.38** The 1999–2000 Transport and Regional Services Program Budget Statement outlined a commitment to review national roads objectives and to report on a network of nationally significant roads by November 1999. ANAO fieldwork identified that these tasks had not been completed by mid 2000.

**2.39** In the period 1969 to 1984 the BTE and the previous Bureau of Roads undertook regular, systematic evaluation of the Australian road system. The last review completed in 1984 reported that urban arterial roads were the only road category for which improvements made over the preceding decade were insufficient to maintain annual service levels.

**2.40** The lack of appropriate analytical considerations in the outlay of National Highway System funds could lead increasingly to the commitment of funds on maintaining the existing system without regard to the relative value of each road, and to a geographical spread of funds than one based on social and economic returns. The establishment of agreed design standards for National Highway links based on quantitative criteria would greatly improve the advice that the Department could place before Ministers in selecting projects. It would also enable better identification of achievable goals within overall funding constraints.

**2.41** For the purpose of ensuring that adequate standards apply to National Highway projects the *ALTD Act* provides for the Minister to request information from the States and to notify States of standards that the Minister considers necessary to be observed. This provides an appropriate framework for the Department to incorporate needs analyses and performance reporting of existing conditions on the National Highway System that would assist with an improved assessment of priorities for funding applications from States. This approach could link the National Highway System objectives with corridor goals and link strategies by defining performance indicators that measure appropriate identifiable outcomes. Such a framework may assist in guiding investment decisions regarding the optimum timing for new projects and maintenance programs by establishing minimum physical standards and upgrade intervention criteria (warrants for improvement works) based on traffic levels of service and safety considerations.

**2.42** The Department advised ANAO that it has agreed to consider the use of a warrants based analysis to develop its forward program and has asked ARRB–Transport Research to review the construction standards for the National Highway System as a preliminary step to considering a warrants based approach.

**2.43 Finding:** The Minister for Transport and Regional Services announced a series of road network funding objectives in the 1998–99 Budget Statements that defined fourteen outcomes anticipated to be achieved during the next 10 years. At the same time the Department developed a series of National Highway corridor strategies that outlined existing conditions; deficiencies; short, medium and long term needs; and listed works identified in forward and future programs to implement this strategy. Performance measures for road network funding objectives and the corridor strategies are not contained in the National Highways System program objectives.

**2.44** The lack of appropriate analytical considerations in the outlay of National Highway System funds could lead increasingly to the commitment of funds on maintaining the existing system without regard to the relative value of each road, and to a geographical spread of funds than one based on social and economic returns. The establishment of agreed design standards for National Highway links based on quantitative criteria would greatly improve the advice that the Department could place before Ministers in selecting projects. It would also enable better identification of achievable goals within overall funding constraints.

**2.45** The Department advised ANAO that it has agreed to consider the use of a warrants based analysis to develop its forward program and has asked ARRB–Transport Research to review the construction standards for the National Highway as a preliminary step to considering a warrants based analysis.

## Recommendation No.2

**2.46** ANAO *recommends* that the Department of Transport and Regional Services:

- (a) consults with relevant stakeholders to assess the feasibility of developing appropriate performance standards for the National Highways System that can aid in assessing the need and time for new construction, rehabilitation and maintenance;
- (b) considers relating program objectives to identifiable corridor goals, link strategies, annual targets, program outcomes and agency performance measures, using States needs analysis information as appropriate; and

(c) review the need to establish an appropriate data collection regime to ensure timely reporting to Ministers and Parliament against agreed performance measures.

2.47 Department of Transport and Regional Services' response: Agree.

## 3. Financial Management

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### Appropriation arrangements

**3.1** The National Highways and RONIs programs are funded through specific purpose grants from the Commonwealth to the States. Funding is appropriated through a special appropriation, the *Australian Land Transport Development Act 1988* (ALTD Act), which provides greater administrative flexibility than an annual appropriation that would lapse on 30 June each year.

**3.2** The ALTD Act establishes a funding reserve (Section 11) which, prior to 1 July 1999, was known as the Australian Land Transport Development (ALTD) Reserve. On commencement of the *Financial Management Legislation Amendment Act 1999* (FMLA Act)<sup>18</sup> on 1 July 1999, the ALTD Reserve was renamed the ALTD Account, which is a Special Account for the purposes of the *Financial Management and Accountability Act 1997*, and certain other provisions were modified. At the same time, traditional Commonwealth fund accounting arrangements were abolished and expenditure controls applying to individual special appropriations were devolved from the Minister for Finance and Administration to the Chief Executive Officers of agencies (see Finance Circular 1999/3). These legislative changes affected accounting arrangements applying to former components of the Reserved Money Fund.

**3.3** The ALTD Act provides that amounts equal to the road user charge received by the Commonwealth shall be credited to the ALTD Account (Section 12 of the ALTD Act as modified by Section 5(6)(a) of the FMLA Act). The road user charge is a proportion of the amount of excise duty or customs duty, paid to the Commonwealth, in respect of motor spirit, or diesel fuel, entered for home consumption. The Act provides that the Minister may, after consultation with the Treasurer, determine in writing, the charge rate in respect of a financial year (Section 10). However, if the Minister does not formally determine the charge rate, a default rate

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<sup>18</sup> The purpose of the FMLA Act was to align the legislative framework provided by the *Financial Management and Accountability Act 1997* (FMA Act) with the accrual financial framework that commenced on 1 July 1999. The FMLA Act repealed the provisions dealing with fund accounting while retaining the essential features of the funds - the ability to hypothecate money for specified purposes - through provisions to establish Special Accounts within the Consolidated Revenue Fund (Financial Management Legislation Amendment Bill 1999 Explanatory Memorandum).

of 4.95 cents per litre applies (Section 3). The Minister has not made a determination of the charge rate under Section 10 of the ALTD Act since 1993-94. The Department advised ANAO that:

*As the setting of the charge was administratively cumbersome and had no impact on funding levels it has fallen into disuse. It was estimated in October 1997 that the charge rate would need to be set at around 3.1 cents per litre to recover current funding levels, and the rate would have fallen since then.*

**3.4** ANAO estimates that, since 1994-95, the amount available for expenditure from the ALTD Account pursuant to the ALTD legislation would amount to some \$2.9 billion as at 30 June 2000 (excluding any interest received from the investment of moneys from the Account). DTRS advised ANAO in January 2001 that:

*The Department does not consider that \$2.9 billion is available for expenditure from the ALTD Special Account. Under arrangements for making payments under the ALTD Act, funds are placed into the account just prior to payment by the Department of Finance and Administration, and sufficient only to meet the payment. The Department administers the ALTD program to expend the funds allocated by the Government to the program in the Budget.*

**3.5** In response to DTRS comments, ANAO observes that the ALTD Account no longer comprises money set aside from the Consolidated Revenue Fund (CRF) but is essentially a 'ledger account' recording a right to draw money from the CRF. The ALTD Act provides in Section 10 for the Minister to make an annual determination of the charge rate, which has not occurred since 1993-94. In the absence of such a Ministerial determination the stipulated charge rate applying to excise credited to the ALTD Account is 4.95 cents per litre. Since 1994-95, only around two thirds of the amount calculated pursuant to the legislation has been expended resulting in a balance of funds available for expenditure under the ALTD program of some \$2.9 billion as at 30 June 2000.

**3.6** ANAO recognises that the Department's administrative practice is to expend ALTD program funds in accordance with the Minister's annual ALTD spending announcement in the Budget, and to draw down funds only when actual payments are to be made. This results in DTRS reporting a minimal balance of funds available for expenditure from the ALTD account. However, the arrangement surrounding expenditure of ALTD funds, while complying with current government payment practice, does not address the specific provisions of the ALTD Act. The amount

available for expenditure pursuant to the ALTD Act is distinct from the balance of an account. As indicated above, ANAO estimates the amount available for expenditure from the ALTD Account pursuant to the ALTD legislation provisions would be some \$2.9 billion greater than that acknowledged by DTRS (see paragraph 3.4).

**3.7** The ALTD Act also requires the Minister to report annually to Parliament on the details of the ALTD Account including moneys credited to and debited from the ALTD Account (Section 41). The ALTD Program Annual Report prepared by DTRS has not provided details of the moneys credited to the ALTD Account and this would be beneficial in light of the changes to the accounting arrangements referred to above. The Department advised ANAO that:

*In accordance with the Government's acceptance of a recommendation of the House of Representatives Standing Committee on Communications, Transport and Microeconomic Reform that the hypothecation provisions of the Act be removed, the Department has proposed such an amendment to the ALTD Act.*

**3.8 Finding:** The ALTD Act specifies that amounts equal to the road user charge received by the Commonwealth shall be credited to the ALTD Account. The road user charge is a proportion of the amount of excise duty or customs duty, paid to the Commonwealth, in respect of motor spirit, or diesel fuel. If the Minister does not formally determine the charge rate, a default rate of 4.95 cents per litre applies. The Minister has not made a determination of the charge rate under Section 10 of the ALTD Act since 1993–94. ANAO estimates the amount available for expenditure from the ALTD Account pursuant to the ALTD legislation provisions would be some \$2.9 billion greater than that acknowledged by DTRS (see paragraph 3.4).

**3.9** The Act also requires the Minister to report annually to Parliament on the details of the ALTD Account including moneys credited to and debited from the ALTD Account. The ALTD Program Annual Report prepared by DTRS has not provided details of the moneys credited to the ALTD Account and this would be beneficial in light of the changes to the accounting arrangements referred to above. The Department is currently reviewing the ALTD legislation and funding arrangements.

## Recommendation No.3

**3.10** ANAO *recommends* that the Department of Transport and Regional Services:

- (a) calculates an appropriate annual charge rate to enable the special appropriation to align with payments made under the ALTD Act, and advise the Minister accordingly;
- (b) prepares a formal determination of the charge rate for the Minister's consideration as provided for under Section 10 of the ALTD Act; and
- (c) reports the moneys credited to and debited from the ALTD Account in the ALTD Program Annual Report tabled in Parliament<sup>19</sup>.

**3.11** Department of Transport and Regional Services' response: **Agree with qualification.** The Department advised:

- Parts (a) & (b): The Department wrote to the excise area of the Australian Taxation Office on 5 October 2000 seeking the data to calculate the appropriate charge rate. When this data is to hand we will provide advice to the Minister on options for addressing the charge rate issue which would include determining a charge rate under section 10.
- Part (c): Under the payment arrangements applying to the Department in its operation of the ALTD Special Account, payments out are matched by equal payments into the Account. The ALTD Program Progress Report does provide details of the amounts paid out. The Department will ensure that details of amounts credited to the fund are recorded in the report.

## Cash management

**3.12** The Department makes monthly payments to the States in respect of the National Highways and RONIs on behalf of the Commonwealth. The terms and conditions of these payments are set out in both the ALTD Act and the associated Notes on Administration. Under the ALTD Act, the Minister has the power to determine the amount and timing of payments from the Account. A payment is to be accompanied by a statement requiring that the payment, or a specified part of it, is to be spent in arranging, assisting or carrying out an approved program or project, or approved class of projects and programs.

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<sup>19</sup> As required by Section 41(1) of the ALTD Act.



**3.13** All payments from the ALTD Account are subject to the condition that the amount will be spent in accordance with the statement accompanying the payment. If a payment from the Account is not spent in accordance with the ALTD Act, then the party to whom the payment was made must repay to the Commonwealth an amount as required by the Minister no greater than the amount that was misspent. The statement accompanying the monthly payment consists of monthly summary payment reports for National Highways and RONI respectively, and the project financial management report for the State, together with a covering fax.

**3.14** As soon as practicable after 30 June each year, recipients of payments must provide annual statements of expenditure in a form approved by the Minister, and also identify any sum that was received but not spent. The Minister also has power to require the relevant Minister of a State to furnish information relevant to matters arising under the Act, within a specified time. All financial transactions relating to the roads programs are subject to the requirements of the FMA Act, which provides the legal framework for the proper management of Commonwealth money and property, including money or property held on trust.

**3.15** One of the Department's performance measures for Portfolio Output 4.4, *Administration of Programs and Grants for Industry*, is to ensure that the cash flow is managed to ensure best value for Commonwealth funds<sup>20</sup>. The Department pays the States monthly in advance, on or around the 22<sup>nd</sup> of each month. The monthly payment is based on an estimate of each State's likely expenditure over the forthcoming month.

**3.16** States are required to report monthly to the Commonwealth on the financial management of individual road projects, and if reports are not made, a portion or all of the monthly payment may be withheld. The Notes on Administration incorporates a proforma identifying the information to be provided in the monthly report from the States. The Department provided the States with a replacement proforma in 1994, advising them that it would be incorporated into the next edition of the Notes on Administration. The States currently report to the requirements of the latter proforma.

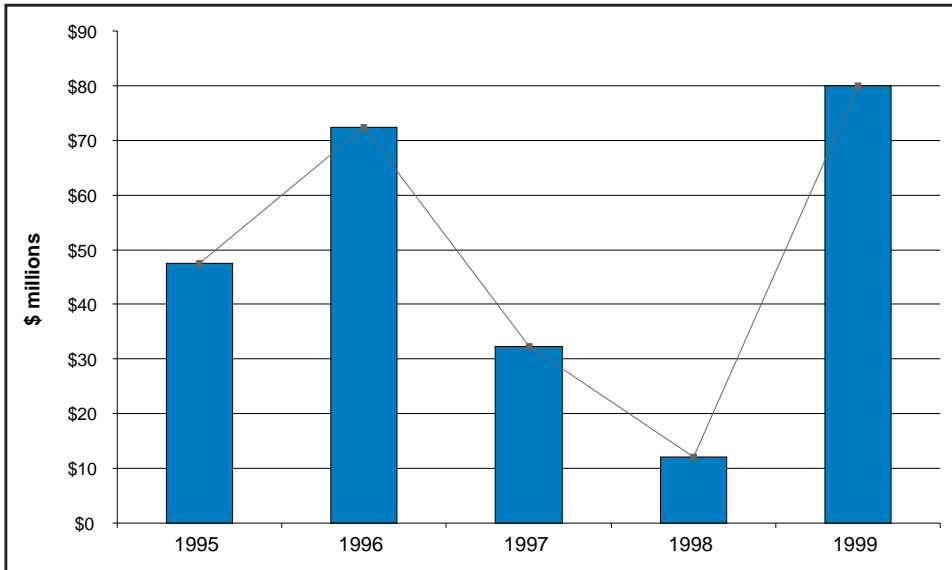
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<sup>20</sup> DTRS Portfolio Budget Statement 1999–2000.

**3.17** Some variation from the forecast monthly expenditure by the States is to be expected because of unforeseeable factors such as the impact of adverse weather conditions on the progress of work, or complications in excavation work. This can delay work, and result in lags in claims for reimbursement. As a result, projects can be sufficiently delayed to continue past their scheduled completion date, and funds can remain unspent at the end of a financial year.

**Figure 3.1**

**Carryover of Commonwealth Payments to States at 30 June 1995 to 1999**



Note: Expenditure by the States in excess of Commonwealth payments for the amounts of \$3.9 million, \$2.8 million and \$2.0 million at 30 June 1997, 1998 and 1999 respectively are not included.

Source: ANAO analysis of Statements of Expenditure from State Auditors-General, provided by DTRS.

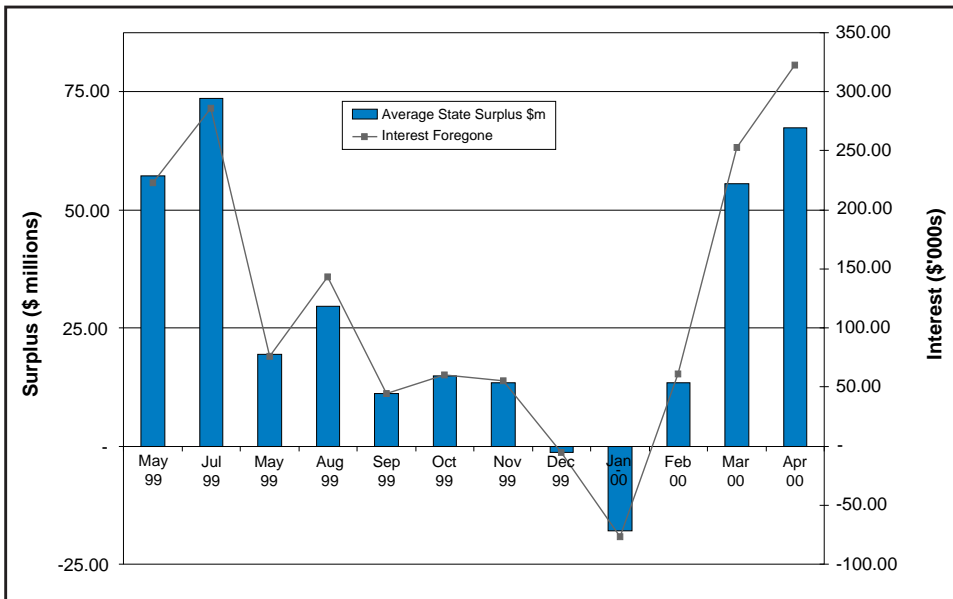
**3.18** ANAO analysis of data from the States' annual statements of expenditure to quantify the level of unspent Commonwealth payments at the end of each financial year from 1994–95 to 1998–99 (see Figure 3.1). The Department advised ANAO that if there are unspent funds from the previous year it withholds monthly payments at the commencement of each new financial year until the carried over funds are expended. ANAO found that following a peak of \$72.4 million in unspent payments in the 1995–96 year, unspent payments steadily and significantly declined until 1998–99, when they increased to \$79.9 million.

**3.19** In 1999–2000, the States held surpluses each month during the year with the exceptions of the months of December and January. The estimated average level of surplus by month is presented in Figure 3.2.

As a result of advance monthly payments to the States, the Commonwealth forfeited an estimated \$1.4 million in potential interest received in the period May 1999 to April 2000.

**Figure 3.2**

**Average Monthly State Surplus and Commonwealth Interest Foregone**



Note: The interest rate used is the 5 week Treasury note market yield for each month (Reserve Bank of Australia Bulletin May 2000).

Source: ANAO analysis of Monthly Payment Reports provided by DTRS.

**3.20** ANAO Audit Report No. 31, 1998–99 recommended that where specific purpose payments are paid in advance, agencies, where cost effective, consider moving to smaller and more frequent payments in line with better cash management practice<sup>21</sup>. For example, ANAO estimated that if Commonwealth payments to the States from May 1999 to April 2000 had been made fortnightly, instead of monthly in advance, the savings for the period would have been nearly \$0.8 million.

<sup>21</sup> Recommendation No. 8(b) of ANAO Audit Report No.31, 1998–99, *The Management of Performance Information for Specific Purpose Payments—The State of Play*.

**3.21 Finding:** States are required to report monthly to the Commonwealth on the financial management of individual road projects, and if reports are not made, a portion or all of the monthly payment may be withheld. The Department pays the States monthly in advance, on or around the 22<sup>nd</sup> of each month. The monthly payment is based on an estimate of each State's likely expenditure over the forthcoming month. ANAO found that following a peak of \$72.4 million in unspent payments in 1995–96, unspent payments steadily and significantly declined until 1998–99, when they increased to \$79.9 million. On average, the States held monthly surpluses during the year with the exceptions of the months of December and January. As a result of advance monthly payments to the States, the Commonwealth forfeited an estimated \$1.4 million in potential interest received in the period May 1999 to April 2000. ANAO estimated that if Commonwealth payments to the States from May 1999 to April 2000 had been made fortnightly, instead of monthly in advance, the savings for the period would have been nearly \$0.8 million.

## **Recommendation No.4**

**3.22** ANAO *recommends* that the Department of Transport and Regional Services considers moving to smaller and more frequent payments in line with better cash management practices.

**3.23** Department of Transport and Regional Services' response: Agree.

## **Project cost management**

**3.24** An effective financial management system should have in place procedures to promptly identify project cost changes. The early identification of budget over-runs and savings enables funds to be reallocated without the need for unnecessary provision of additional amounts. An improved approach to the financial monitoring is outlined in Figure 3.3. This requires a program manager to monitor (monthly and annually) budget allocation versus actual expenditure, and estimated versus actual project cost.

**Figure 3.3**  
Improved Approach to Financial Management

Programs	Year 1	Year 2	Year 3	Year 4	etc	Project Totals
Projects						
Road 1						
Road 2						
Road 3						
Road 4						
Road 5						
Road 6						
etc						
Program Totals						

Source: ANAO

**3.25** The Department has a Roads Payment System (RPS) that is used to track project expenditure and when a project is first approved, the estimated cost is recorded in the system. If a variation to this amount is made, the system overwrites it with the new total. The RPS identifies when payments for a project have reached this approved expenditure limit, but it does not report on how the actual cost compares to the original approved cost.

**3.26** ANAO reviewed a sample of 52 projects to compare the actual costs with the original estimates. Of these, nine were excluded from further consideration because they were still in progress. A further three were excluded as: one was completed in 1992; one was a component of a project instead of a project in its own right; and one had completely changed in scope from that originally approved. Of the remaining 40 projects, 18 were over budget, and 22 were within budget.

**3.27** The 18 projects that were over budget had total original estimated costs of \$175.7 million, and total actual costs of \$209.6 million, thus exceeding their original approved costs by \$33.9 million. In percentage terms, 45 per cent of the sample of completed projects exceeded their estimated costs by around 20 per cent. The 22 projects that were within budget had total original estimated costs of \$925.8 million, and total actual costs of \$869.5 million.

**3.28** The Departments' RPS effectively identifies when a State has reached its expenditure limit for a particular project. However, the RPS does not report on how actual costs compare to the original estimated costs. ANAO considers that the Department should revise the RPS to maintain the original estimated costs of approved projects, and report the original estimates in the annual ALTD progress report.

**3.29 Finding:** An effective financial management system should have in place procedures to promptly identify project cost changes. The early identification of budget over-runs and savings enables funds to be reallocated without the need for unnecessary provision of additional amounts. ANAO examined a sample of 40 completed projects to compare actual costs with the original estimates and of these 18 were over budget, and 22 were within budget. The 18 projects that were over budget had total original estimated costs of \$175.7 million, and total actual costs of \$209.6 million, exceeding their estimated costs by about one fifth. The Department's Roads Payment System (RPS) effectively identifies when a State has reached its expenditure limit for a particular project. However, the RPS does not report on how actual costs compare to the original estimated costs. ANAO considers that the Department should revise the RPS to retain the original estimated costs of approved projects, and report the original estimates in the annual ALTD progress report.

## Recommendation No.5

**3.30** ANAO *recommends* that the Department of Transport and Regional Services:

- (a) monitors estimated versus actual project costs as well as program based comparisons against States' budget allocations with States' total actual expenditure; and
- (b) revises the Roads Payment System to retain the original estimated cost of each approved project and report this in the annual ALTD progress report.

**3.31** Department of Transport and Regional Services' response: Agree.

## 4. Asset Management

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### Asset condition

**4.1** The process of road deterioration can be slowed significantly by effective asset management. This can extend the pavement life and ensure a safe and smooth travelling surface. Various techniques which measure, for example, roughness, rutting, cracking and skid resistance are used to monitor surface conditions and determine maintenance needs. Preventive maintenance can be a cost-effective way of reducing pavement deterioration thus postponing more expensive treatments.<sup>22</sup>

**4.2** The 1997 BTE Working Paper 35 titled *Roads 2020* forecast expenditure needs of \$16.8 billion including a backlog of \$2.6 billion which it reported was economically warranted immediately. These backlog works comprise \$1928 million for road capacity improvements (widening and/or adding lanes); \$607 million for town bypasses; \$15 million for bridge replacement; and \$49 million for maintenance. The 1998 to 2020 works assessed as economically warranted, totalled \$14.195 billion.

**4.3** The Department has utilised BTE reports in preparing its advice to Government on the overall investment required. ANAO considers that it is possible for the Department to agree with each State the total sum required each year to maintain existing conditions. An agreed asset preservation program, breaking the task into components and then discussing and agreeing the separate needs of each component of an overall maintenance program, would allow better definition of roads funding needs. The Department recently commissioned a consultant to study the issue and develop a business case methodology for determining the appropriate level of funding to be allocated to maintaining the National Highway System. The establishment of a business case methodology is an improvement that will assist the Department in advising Ministers on the funding needs of the National Highway System. The Department is also currently working with the ARRB-Transport Research to develop a framework within which it can recommend decisions on maintenance funding based on needs analysis

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<sup>22</sup> *A stitch in time—Victoria's road maintenance strategy* Vicroads July 1993.

**4.4** The National Highways construction standards (as defined in the Notes of Administration<sup>23</sup>) require a new pavement design life<sup>24</sup> of at least 20 years and guidelines indicate minimum conditions that should apply to National Highways. These include NAASRA Roughness Meter (nrm) counts not to exceed 120 counts/km for freeways and 150 counts/km for lower standard lengths<sup>25</sup>. A newly constructed or rehabilitated road should exhibit below 60 roughness counts/km.

**4.5** The design life requirement of 20 years contrasts with advice from the States that they annually rehabilitate in the order of 1.5–2 per cent of the National Highway System, implying that continuation of this trend would lead to actual pavement lives having to be extended to in excess of 50 years. As a very broad generalisation based on Australian research literature it is possible to assume a roughness loss of 1.5–2.5 nrm counts per annum<sup>26</sup> that adds up to some 15–25 nrm counts deterioration in the 10 years between each reseal. Assuming a reseal extends the pavement life another five years, then after two reseals (that is after 30 years), the roughness could have decreased from 60 nrm counts to around 105–135 nrm counts, that is the point at which the Notes on Administration Guidelines require and user surveys confirm, rehabilitation is required.

**4.6** A significant proportion of the National Highway System is relatively new, having been constructed since 1975. The Department advised ANAO that it keeps no records of pavement age to assist in planning and programming future rehabilitation expenditure. The absence of such critical data inhibits the Department's capacity to monitor future service levels and investment needs. Maintenance expenditure totalled \$281.48 million in 1999–2000. The development of performance targets for maintenance expenditure could be enhanced if, as a part of this process, specific consideration was given to formulating targets for investment in structural maintenance and resurfacing to maintain the existing National Highway asset.

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<sup>23</sup> Elements of the Notes on Administration relevant to the maintenance process includes: upgrading and Maintenance Program—must be submitted within four weeks of the National Highway strategy being advised to the States for the following financial year for approval by the Minister; and approved procedures for upgrading and maintenance and general administration.

<sup>24</sup> Pavement design life is a function of the expected traffic flow as expressed as a function of the anticipated axle loads to be experienced.

<sup>25</sup> *Notes on Administration—Guidelines for minimum requirements for National Highways*, July 1992.

<sup>26</sup> *A parametric study of the influence of maintenance and rehabilitation strategies on network life-cycle costs* ARRB Transport Research Report 336—September 1997.



**4.7 Finding:** The process of road deterioration can be slowed significantly by effective asset management. This can extend the pavement life and ensure a safe and smooth travelling surface. ANAO considers that it is possible for the Department to agree with each State the total sum required each year to maintain existing conditions. An agreed asset preservation program, breaking the task into components and then discussing and agreeing the separate needs of each component of an overall maintenance program, would allow better definition of roads funding needs. The Department recently commissioned a consultant to study the issue and develop a business case methodology for determining the appropriate level of funding to be allocated to maintaining the National Highway System. The Department is also currently working with the ARRB–Transport Research to develop a framework within which it can recommend decisions on maintenance funding based on needs analysis.

**4.8** The National Highways construction standards (as defined in the Notes of Administration) require a new pavement design life of at least 20 years and guidelines indicate minimum conditions that should apply to National Highways. This design life requirement of 20 years contrasts with advice from the States that they annually rehabilitate in the order of 1.5–2 per cent of the National Highway System, implying that continuation of this trend would lead to actual pavement lives having to be extended past 50 years. The Department advised ANAO that it keeps no records of pavement age to assist in planning and programming future rehabilitation expenditure. The absence of such critical data inhibits the Department’s capacity to monitor future service levels and investment needs.

## Information management

**4.9** Since the Commonwealth does not own the asset, ANAO was advised by the Department that it has Performance Agreements with the States to ensure the Commonwealth’s maintenance funding is effectively used to produce the required outcomes. The States agree to maintain the National Highways with the funds provided and supply the Department with data on road conditions. The Notes on Administration require States to have Pavement Management Systems (PMS) and to report annually on their management of the system.

**4.10** The Department information holdings have deteriorated since the 1993 ANAO audit. At that time the Department used a program named FOCUS, which was replaced by another system named PROMIS, but this has been disconnected. It was to have been complemented by a system developed by consultants as part of a strategic corridor planning study but this was not completed. Instead, the Department has created two electronic relational database systems:

- the Roads Payment System comprising a Payments Processing Module (PPM) where financial data as provided by the States in their monthly progress reports for each new works project is used to calculate the monthly payment and several other modules that update project Information and provide reports; and
- the Road Condition database which is used for analysing the States' reports on road condition as per the Maintenance Agreements.

**4.11** The Department relies on the States for reports on the volumes and types of traffic using the National Highway, for the purpose of reviewing the performance of the National Highway in meeting current and future demand, and also for the effectiveness of the maintenance program which the Commonwealth funds and which the States administer. In the absence of appropriate asset and levels of service information holdings by the Department on the National Highway System, the ANAO undertook an extensive performance information data collection exercise with the States.

**4.12** The ANAO's inquiries in relation to traffic count data raised concerns about the accuracy of traffic volume counts that the Department was using for resource allocation decisions. The Department has always assumed reported counts would be made according to acknowledged standards; be consistent between States; and be comparable over time. A variety of problems were apparent in relation to the information provided to the Department. The procedures used to count traffic vary not only from jurisdiction to jurisdiction but sometimes within individual jurisdictions.

**4.13** In response to the data problem identified by ANAO, the Department commissioned a study by external consultants in October 2000 to determine:

- how each State defines, records, interprets and reports traffic counts;
- the impact of the accuracy of the reported usage figures;
- whether each State has in place quality assurance systems which are effective in ensuring consistency and accuracy over time within each jurisdiction;
- how Australian practice compares with overseas best practices;

- the degree of consistency between jurisdictions; and
- the degree to which it would be feasible to standardise the collection and reporting of road usage data for the National Highway System; and
- the best approach to ensure consistency between road usage data from the various jurisdictions, including performance specifications for the equipment for use in making traffic counts.

**4.14 Finding:** The Department has Performance Agreements with the States to ensure the Commonwealth's maintenance dollar is effectively used to produce the required outcomes. The States agree to maintain the National Highways with the funds provided and supply the Department with data on road condition. The ANAO's inquiries in relation to traffic count data raised concerns about the accuracy of traffic volume counts that the Department was using for resource allocation decisions. The Department has always assumed reported counts would be made according to acknowledged standards; be consistent between States; and be comparable over time. A variety of problems were apparent in relation to the information provided to the Department. The procedures used to count traffic vary not only from jurisdiction to jurisdiction but sometimes within individual jurisdictions. In response to the data problem identified by ANAO, the Department commissioned a study by external consultants in October 2000.

### **Benchmarking of maintenance expenditure**

**4.15** In 1997, the Department advised HORSCCTMR that the focus for maintenance has shifted away from an input control approach to a focus on outputs as measured by indicators. The Maintenance Agreements with the States do not allow for significantly improved road conditions. The Maintenance Agreement with the States include performance indicators (by State) for the current three year period, which show no agreement-defined improvement in roughness but an actual commitment to a deterioration in road surface conditions in every State except one where no change has been agreed. ANAO could find no correlation between the performance indicators, the agreed road conditions to be achieved by the States and the annual funding allocation to be provided by the Commonwealth. The Department advised ANAO in October 2000 that it had commissioned the ARRB-Transport Research to undertake analysis of the condition of the National Highway in each State and to report on indicative funding levels to maintain and improve this condition. The Department noted that initial results from this work has been received and are being assessed prior to the Department undertaking consultation with the States.

**4.16** The efficiency of National Highway System maintenance was reviewed by ANAO using Data Envelopment Analysis (DEA) which is a linear programming tool for benchmarking the performance of individual road links. The aim was to identify those links displaying best-practice performance and then develop a measure of the technical efficiency of the practices used for the management of each link. Best practice performance was assessed as the minimum possible maintenance expenditure for a given quantity and quality of road services<sup>27</sup>.

**4.17** In the DEA analysis, efficiency refers to the ratio of ‘maintenance expenditure at best practice’ to actual expenditure. This ratio takes a value between zero and unity with an efficiently maintained road link defined as one that has an efficiency ratio of unity (100 per cent). A less efficiently maintained road link is one that has a ratio below unity (below 100 per cent) and whose expenditure on maintenance may be able to be reduced by adopting the best practice of the maintenance programs of the identified best-practice partners.

**4.18** Existing road condition and usage information was supplied to ANAO by the State Road Authorities. Roughness was used as a proxy variable to reflect the age and design and construction standard of the road link. The analysis hypothesised that older road links would, all else being equal, require more maintenance and probably exhibit a higher roughness count. Maintenance expenditure by National Highway System link was provided by the Department from Maintenance Agreement information for the six year period 1994–95 to 1999–00.

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<sup>27</sup> The notion of ‘road services’ was interpreted through the use of data for

- the daily total traffic flow over the link (Annual Average Daily Traffic—ADT—vehicles/day);
- the daily commercial vehicle flow over the link (trucks/day);
- the length of the link (kms);
- the pavement surface area over the link expressed in lane-kilometres;
- the pavement surface type;
- the link roughness; and
- other variables that have been identified as affecting the annual expenditure on road maintenance include rainfall, terrain and roughness.

**4.19** The DEA analysis of the maintenance expenditure by link uses the 1998–99 expenditure figures as the exercise is principally for illustrative purposes. The DEA analysis constructed for each National Highway maintenance program a counterpart frontier program that is capable of achieving the same or a quantitatively larger level of road services at lower maintenance cost (expenditure). The mathematical programming problem is to minimise a road link’s expenditure on maintenance subject to it maintaining at least the same usage in terms of trucks and cars per lane kilometre with the same surface. If the DEA cannot construct such a benchmark from available data on road links, then the road link’s maintenance program is identified as ‘best-practice’ or ‘efficient’. If the DEA constructs a benchmark from the available data that is capable of performing the annual road maintenance program at less cost, then the road link is identified as less efficient and capable of performance improvement. Accordingly, a road link’s inefficiency measures the potential for achieving savings in annual road maintenance expenditure through the adoption of best-practices in the management of the road maintenance program.

**4.20** The average technical efficiency of the National Highway System maintenance program as a whole was assessed as up to 69 per cent. This figure should only be taken as illustrative. In theory, to achieve 100 per cent efficiency across a network, it is necessary to identify the best practice links and find ways of bringing the less efficient links up to this standard.

**4.21** The lack of robust data was evident with traffic counts and the problem of mixing rehabilitation and maintenance expenditure was found to distort the findings of this benchmarking study. Also the Department noted that the data used represents only a snapshot of the condition of the National Highway System at a particular time period which does not reflect the change in condition of the road pavement over the period covered by the maintenance spending. Normal life cycle cost analyses recognise a 30 year cycle of road deterioration and rehabilitation. To the extent that the distribution of pavement ages within each link is uneven, the results will be distorted. In addition, the study does not look at the trade-off between construction and maintenance standards to achieve the lowest whole of life costs.<sup>28</sup>

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<sup>28</sup> DTRS letter to ANAO of 9/8/99 in response to draft Monash University Consulting Report.

**4.22 Finding:** The Maintenance Agreements with the States did not provide for significantly improved road conditions. The Maintenance Agreement with the States include performance indicators (by State) for the current three year period, which show no agreement-defined improvement in roughness but an actual commitment to a deterioration in road surface conditions in every State except for one where no change has been agreed. ANAO could find no correlation between the performance indicators, the agreed road conditions to be achieved by the States and the annual funding allocation to be provided by the Commonwealth. The Department advised ANAO in October 2000 that it had commissioned the ARRB-Transport Research to undertake analysis of the condition of the National Highway in each State and to report on indicative funding levels to maintain and improve this condition. The Department noted that initial results from this work have been received and are being assessed prior to the Department undertaking consultation with the States.

**4.23** The ANAO conducted a Data Envelopment Analysis (DEA), which is a linear programming tool, for benchmarking the performance of individual road links. The aim was to identify those links displaying best-practice performance and then develop a measure of the technical efficiency of the practices used for the management of each link. The average technical efficiency of the National Highway System maintenance program as a whole was assessed as up to 69 per cent. The lack of robust data was evident with traffic counts and the problem of mixing rehabilitation and maintenance expenditure was found to distort the findings of this benchmarking study.

## Recommendation No.6

**4.24** The ANAO *recommends* that the Department of Transport and Regional Services appropriately define National Highway expenditure categories to complement the legislation and facilitate whole of life analysis of investment options.

**4.25** Department of Transport and Regional Services' response: Agree.



Canberra ACT  
8 February 2001

P. J. Barrett  
Auditor-General

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