

VICTORIA

Auditor-General
of Victoria

PERFORMANCE AUDIT REPORT No. 61

ROAD CONSTRUCTION IN VICTORIA

Major projects
managed by VicRoads

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The President
The Speaker
Parliament House
Melbourne Vic. 3002

Sir

Under the provisions of section 16 of the *Audit Act* 1994, I transmit the Auditor-General's Performance Audit Report No. 61, *Road construction in Victoria: Major projects managed by VicRoads*.

Yours faithfully

J.W. CAMERON
Auditor-General

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Foreword

This Report focuses on the important responsibilities assigned to VicRoads for the planning and management of major road projects. In aggregate, around \$560 million is provided annually to VicRoads by the Australian and State Governments for road development purposes, including construction and maintenance.

To its credit, VicRoads has pursued its responsibilities over the years in a very professional manner. A key conclusion from this performance audit is that VicRoads has made a marked contribution to enhancing the State's infrastructure through progressive development of the road network.

Many of the findings in this Report identify avenues for VicRoads to build on its past achievements and bring about further improvement in managing road planning and construction, and in reporting on its performance to the Parliament. I consider the organisation is well placed to assess these findings as part of its ongoing endeavours to apply best practice and maintain a reputation for innovation and excellence in its road management functions.

The Report contains recommendations for strengthening accountability and transparency in the subject area at central government level. I am sure that these recommendations, if implemented, would assist community understanding and awareness of government priorities for future road projects. The Parliament would also be better informed on the extent of road funding available each year and the manner in which such funding has been applied within the State.

The need for improved consolidated annual reporting on the availability and use of funding may also be applicable in other major areas of service delivery within the public sector, especially where there is an integration of federal and State funding. Examination of these other areas with a view to remedying any similar accountability and transparency gaps would constitute positive action by the Government.

J.W. CAMERON
Auditor-General

Part 1

Executive summary

Part 1.1

Overall conclusion

Outline of the subject area

1.1.1 This Report documents the results of a performance audit which examined the manner in which VicRoads manages major road construction projects within Victoria. The audit focused on projects with a value in excess of \$5 million. The scope of the audit did not encompass the construction of those roads (for example local roads) which fall within the responsibility of municipal councils.

1.1.2 The Victorian road network, comprising in excess of 160 000 kilometres of roads, is one of the State's major capital assets. Annual funding of around \$550 million is made available to VicRoads for the construction, upgrading and maintenance of roads. The road network is an essential element of the social, recreational and economic development of the State.

1.1.3 VicRoads has implemented an outsourcing strategy for a number of years now under which a significant proportion of functions associated with the construction of roads is carried out under contract by private sector companies.

1.1.4 The development of major roads can occur over a long period of time with certain individual projects taking 10 years or longer from the initial development of a project concept through to the ultimate completion of construction works. The management responsibilities of VicRoads for major projects encompass all phases of the road construction process and involve high-level strategic planning for the road network, individual project planning, formulation of funding submissions to the Australian and State Governments, preparation of technical specifications and requirements, development of contracts, selection of contractors and the monitoring of contracts, as well as construction works.

VicRoads - a professional and competent manager of road projects

1.1.5 Most of the findings in this Report demonstrate that VicRoads manages its major road construction projects in a sound and competent manner. From this audit, it can be concluded that VicRoads is a highly professional organisation which, over the years, has made a substantial contribution to the continuing development of roads as a significant component of the State's infrastructure.

1.1.6 In pursuing its responsibilities as the Government's key road authority, VicRoads has placed a high priority on ensuring that roads of an acceptable quality are constructed efficiently and the State's interests in contractual arrangements are adequately protected.

Avenues for achieving further improvement

1.1.7 The Report identifies several areas where VicRoads can introduce further improvement in the management of its road construction responsibilities and build on its past achievements.

1.1.8 The State's 2 road strategies, *Linking Melbourne* and *Linking Victoria*, were released by VicRoads in 1994 and 1996, respectively. These strategies document plans for improving the road network and have strongly influenced the setting of priorities and development of funding submissions to government in recent years. VicRoads should now update the 2 strategies with the aim of achieving greater consistency with the State's more recently-issued transport policies and emerging metropolitan and rural road needs.

1.1.9 Since the early 1990s, VicRoads has allocated an increasing range of functions to its road construction contractors. The packaging of previously separate elements of works into one single contract for major projects and the transition from construct-only contracts to contracts encompassing both design and construct tasks have been key features of this direction.

1.1.10 These contemporary approaches are positive initiatives by VicRoads and offer clear potential for lower costs and better quality outcomes in major road construction projects. Nevertheless, the strategies have raised some concern within the industry, particularly the likelihood that a small number of very large companies will dominate road construction and exercise significant control over sub-contracting practices.

1.1.11 VicRoads faces the challenge of ensuring the expanding use of larger and more encompassing contracts does not adversely impact on the overall viability and level of competition within the industry as a whole. It also needs to provide a leadership role in encouraging industry best practice in the changing contractual environment and bringing about co-operative relationships between large construction companies and small operators. These relationships will be important in order to create opportunities for smaller companies to develop business skills beyond their existing capabilities.

1.1.12 Major individual claims advanced by contractors for variations to contracts (such as unforeseen circumstances impacting on works) are

contracts (such as unforeseen circumstances impacting on works) are initially examined within VicRoads by the relevant project manager (in the role of project superintendent). For any claims rejected by the superintendent, there is currently no impediment to contractors aggregating these claims and submitting them in total at the end of the project to the Chief Executive of VicRoads for consideration and negotiation. While VicRoads does not encourage claims of this nature, the practice is nevertheless a frequent occurrence with road construction contracts.

1.1.13 The presence of certain risks, including the potential for additional costs and litigation action, to VicRoads associated with aggregated claims submitted by contractors at the end of a project can place it in a disadvantageous position in negotiating the settlement of such claims. These risks would be minimised if all claims initially rejected by the relevant project superintendent were subject to timely final resolution by VicRoads on an individual basis.

1.1.14 VicRoads utilises a range of methods to monitor the performance of contractors including the holding of periodic on-site meetings, scrutiny of changes to contractors' programs and receipt of monthly reports outlining progress against established milestones. A number of areas requiring improvement were identified in regard to these mechanisms including the need for more regular and effective site meetings, greater attention directed to ensuring that contractors furnish programs of an acceptable standard in a timely manner and a more structured approach to the carrying out of post-contract and post-project evaluations.

1.1.15 To its credit, VicRoads has over the years directed high priority to ensuring that contractors selected to undertake road construction works are capable of meeting their obligations in delivering quality outcomes within established cost and time parameters. In pursuing this aim, it has developed a 3-staged approach to the engagement of contractors incorporating, as a specific feature, a scheme for the pre-qualification of contractors.

1.1.16 While the pre-qualification scheme was found to be comprehensive and well managed, VicRoads should give higher priority to greater scrutiny of the ongoing financial viability of pre-qualified contractors.

Scope for a national approach to pre-qualification of contractors

1.1.17 From a wider perspective, a number of municipal councils operate their own pre-qualification schemes and it is understood that the Department of Infrastructure is currently considering the setting up of a pre-qualification database which could apply to contractors engaged by it in infrastructure works.

1.1.18 There would be merit in the Government assessing the feasibility of implementing a common pre-qualification scheme for road construction contractors engaged at both State and local government levels. Also, with the significant involvement of the Australian Government in funding construction of national highways and roads of national importance, the value of the adoption of a national approach to pre-qualification of contractors could be assessed.

1.1.19 The establishment of a uniform approach within government to contractor pre-qualification should, through the use of common standards, lead to better quality outcomes in construction works and lower administrative costs to both government and contractors.

Ensuring adequate future levels of skilled project managers

1.1.20 Because of its longstanding outsourcing policy, considerable downsizing has occurred at VicRoads over the last decade with staff numbers falling from around 6 000 in 1989 to around 2 300 in 1999. Despite this progressive decrease in staff numbers, VicRoads retained a number of engineers with considerable hands-on experience in the undertaking of road construction works. These engineers assumed broader project management responsibilities for overseeing construction works outsourced to contractors.

1.1.21 Because of ongoing staff movements and retirements, VicRoads has faced, over recent years, the task of identifying new sources of suitably qualified staff with the necessary hands-on road construction experience to carry out project management and quality assurance responsibilities. It has responded to this challenge through the creation of a graduate development program which *“evolved from the need for a pool of talented graduates with the potential ability to lead the organisation into the future”*.

1.1.22 VicRoads should be commended for its graduate development initiative in this important area. However, the future loss of experienced managers has ramifications for VicRoads in terms of ensuring an adequate and ongoing capability for the monitoring of contractors. Specialists engaged during the audit considered that effective monitoring of contractors requires the involvement of personnel with wide experience in project planning, scheduling of road works, cost estimation and contract administration. It may therefore be necessary for VicRoads to consider additional longer-term staff resourcing strategies for road construction.

Raising the standard of performance measurement and reporting

1.1.23 VicRoads currently reports on its road management activities within a framework of national performance indicators for State road authorities established by the Association of Australian and New Zealand Road Transport and Traffic Authorities (Austroads).

1.1.24 The development of a framework of national performance indicators has proved to be a valuable initiative taken by the road authorities to introduce a uniform approach for the measurement of performance within States. It also assists road authorities in identifying specific areas with potential for achieving further improvements in their operations.

1.1.25 Several important qualifications have to be applied to the national performance framework when forming judgements on the quality of Victoria's overall performance. In this regard, it is difficult to form a definitive conclusion on the relative performance of each State road authority under the framework because of:

- the unique characteristics of the road network and road construction environment within each State;
- differences in the methods utilised by the various road authorities in the compilation of data; and
- the absence of independent assurance on the completeness and accuracy of material submitted by the authorities to Austroads.

1.1.26 On the basis of the information reported by Austroads, VicRoads can be considered to be performing well in planning and prioritising major road construction projects which are expected to provide high levels of economic benefits to the community. However, because of measurement difficulties, the national framework has not, to date, presented information on the extent to which predicted benefits are ultimately realised.

1.1.27 The annual report presented by VicRoads to the Parliament provides a wide range of meaningful information covering the organisation's activities. However, much of the contents encompasses road management matters generally and very little performance material (e.g. actual achievements against advance targets relating specifically to road construction) is contained in the document. There is therefore scope for VicRoads to strengthen the line of accountability to the Parliament and community on its periodic performance in the specific area of road construction. Several suggestions for improving the quality of performance data conveyed annually to the Parliament are outlined in this Report.

Clear need for enhanced accountability and transparency at government level

1.1.28 There are 2 opportunities for the Government to enhance accountability and transparency in this major area impacting on the State's infrastructure.

1.1.29 Firstly, there is an absence of a published strategic plan for road construction within the State which shows, in a consolidated form, the priority ranking assigned by government to future planned projects.

1.1.30 It is considered that a strategic plan of this nature should be compiled by the Government and presented to the Parliament on a periodic basis. The plan should identify any changes in ranking of projects since the previous plan and the reasons for such changes. The magnitude of public funds consumed in road construction and the importance of road infrastructure to Victoria's economy reinforce the value of any action taken to upgrade the transparency of decision-making in this area.

1.1.31 Secondly, there is clear scope for the Government to upgrade the level and quality of published information dealing with the availability and use of road funding. Presentation to the Parliament of an annual consolidated statement showing, for the preceding financial year, the key sources of funding (encompassing allocations by the Australian and State Governments) and the manner in which funds have been applied within the State (such as under the Better Roads Victoria Program) would also strengthen accountability and transparency for this major area of government activity.

1.1.32 The data contained in the annual consolidated statement should be capable of reconciliation with anticipated expenditure on road funding incorporated within the annual budget papers. Currently, it is virtually impossible to identify any links between the published budget figures and related actual expenditure on roads within the State. Attention should also be directed to improving the understandability of category headings and terminology dealing with roads to better meet the information needs of Parliament and the community.

Co-ordinating role of the Department of Infrastructure

1.1.33 The Department of Infrastructure has responsibility for overall co-ordination of infrastructure strategies, incorporating transport planning, within Victoria. A pressing need for the Department is to rectify the delay which has occurred in finalising an overall transport strategy for rural regions. Preparation of a document, *Transporting Victoria*, commenced in 1996 but it still remains in draft form. High priority should be directed to having in place an appropriate up-to-date strategic framework for addressing transport needs within rural areas.

1.1.34 In a positive initiative, the Department has commenced a program of infrastructure reviews at municipal level, in conjunction with municipal councils and VicRoads. The aim of these reviews is to develop specific regional strategies which address the infrastructure and local transport needs of a single municipality or a cluster of adjacent municipalities. To date, one regional strategy has been completed and 2 others are nearing finalisation. Based on current timeframes, strategies for all municipal regions warranting a review will not be completed for several years. The Department should consider fast-tracking the completion of regional strategies to augment future planning and prioritisation of road projects in identified regional areas.

Views
expressed by
industry
participants

1.1.35 During the course of the audit, a questionnaire was issued to around 250 prime contractors and sub-contractors, and subsequent face-to-face interviews were conducted with 24 firms. Arising from this process, sub-contractors raised a wide range of concerns particularly in terms of their relationships with prime contractors in the tendering and administration of road construction projects.

1.1.36 A major area cited by sub-contractors involved allegations of inappropriate payment practices by prime contractors. Around half of the sub-contractors who responded to the questionnaire indicated that they had suffered financial hardship as a result of prime contractors delaying or not paying moneys due for work performed. Sub-contractors also raised other concerns such as prime contractors, after the awarding of tenders, entering into new rounds of negotiations with sub-contractors to pressure them into reducing their earlier cost bids. Sub-contractors viewed this practice as unethical and limiting the ability of some firms to remain in business.

1.1.37 It is emphasised that the matters addressed by respondents represent views of individuals. It is also recognised that many of the issues focus on the contractual relationships between private sector parties and extend beyond the direct responsibility of VicRoads.

1.1.38 Nevertheless, as the Government's key road construction body, VicRoads should at least consider avenues for becoming aware of any unsatisfactory practices within the industry, given the potential adverse impact of unresolved issues or disputes between contractors on the quality, cost and timeliness of road works. One way of addressing this issue could be through the forging of closer co-operative relationships with all parties engaged in road construction projects, for example through periodic industry advisory forums, without unduly interfering with the contractual obligations of the prime contractors and sub-contracting parties.

❑ **RESPONSE** provided by the Chief Executive of VicRoads

VicRoads welcomes the overall very positive findings of the Auditor General's Review and the many specific commendations contained within the body of the report for both the strategic framework which we have established for our operations, and also for the many quality and process initiatives which have been successfully implemented. As the report records this overall positive result was most recently reflected in the results of a public survey of user satisfaction with the performance of the road system in all States of Australia and in New Zealand. Victoria scored the highest rating.

The audit itself is titled "Performance Audit Report – Road construction in Victoria: Major projects managed by VicRoads". It is however an audit of more than construction and has involved a thorough examination of VicRoads broader role of the management of the whole development process of roads within the transport system in Australia especially including the planning and programming processes. VicRoads welcomes this breadth of review but believes that in some specific more detailed comments within the body of the document the word "construction" has clouded the broader view which is generally being taken. An example of this would be the comments on the types of skills and experience required by VicRoads in the future.

The audit has made a number of constructive comments on areas for further improvement by VicRoads. Many of these areas are already being pursued and have been reported as such to Auditor General's staff. Not all have been acknowledged in this report.

VicRoads has only had a short time to review the final draft of this report and therefore our comments at this stage are confined to the larger issues discussed in it. Comment on the specific audit recommendations and current VicRoads initiatives are provided at the completion of each section of the detailed report, and the following general comments are made in response to the audit summary:

- There have been significant changes in VicRoads' dealings within the civil construction industry over the past 5 to 10 years with transfer of responsibility for quality assurance to contractors and significant changes to the packaging of contracts. These could not be imposed suddenly, and have required substantial changes within the industry. This process has been very successful to date and is ongoing with significant initiatives being introduced in the past eighteen months including development of new standard specifications for major contracts and development of an independently certified quality system for contract management;*
- VicRoads contract is with the prime contractor. VicRoads cannot become involved in the relationship between prime contractor and sub-contractor without compromising risk allocation and potential exposure to unreasonable claims. VicRoads does not have a relationship with sub-contractors. We do not believe that it is VicRoads' role to be the overall construction industry watchdog;*
- A number of the more detailed findings, observations and recommendations appear to turn on the opinion of "specialists" engaged in the audit, a number of whom have past and ongoing dealing with VicRoads. VicRoads does not agree with all of the "specialist" opinions. In addition VicRoads considers that a number of these matters are based upon speculative extrapolation (eg. the size of contract packages) and assertion rather than audit findings.*

❑ **RESPONSE** provided by the Chief Executive of VicRoads - continued

VicRoads intends to formally consider each of the individual suggestions contained in this report in a structured manner and I am sure that a substantial number will be implemented in full or in part in the future. Not all of the issues themselves are matters for which VicRoads is primarily responsible, however our review of them will include discussions with the relevant body whether it be the Department of Infrastructure or a central Government Agency.

Overall we value the results of this audit as an opportunity to further improve our performance and the quality of transport services and infrastructure in the Victorian community.

Finally I would like to acknowledge the positive efforts and co-operative approach of the Auditor General's staff in the conduct of this audit which have contributed significantly to a beneficial outcome.

Part 1.2

Summary of audit findings

STRATEGIC PLANNING FOR ROAD CONSTRUCTION

Page 37

- The high-level strategic planning framework in place in Victoria for the construction of roads involves participation by both the Australian and State Governments.
Paras 4.17 to 4.19
- For the 4 year period 1999-2000 to 2002-03, the Australian Government announced in May 1999 an aggregate allocation to Victoria of \$414.5 million for national highways and roads of national importance, with \$81.3 million to be provided in 1999-2000.
Paras 4.26 to 4.30
- In August 1999, the Australian Government determined that it would provide funding towards the reconstruction of Geelong Road on a dollar-for-dollar basis under the roads of national importance program up to a limit of \$120 million, to be made available from 2001-02.
Paras 4.31 to 4.33
- The Department of Infrastructure should rectify the delay which has occurred in finalising an overall strategy for addressing transport needs within rural areas.
Paras 4.34 to 4.37
- The 2 road strategies, *Linking Melbourne 1994 and Linking Victoria 1996*, should be updated by VicRoads to ensure consistency with the State's broader transport policies and emerging metropolitan and rural road needs.
Paras 4.38 to 4.41
- In a positive initiative, the Department of Infrastructure has commenced a program of infrastructure reviews with the aim of developing specific regional strategies which address the needs of a single municipality or a cluster of adjacent municipalities. The Department should consider fast-tracking completion of strategies for all municipal regions warranting review.
Paras 4.47 to 4.50

- The funding of road strategies represents a major investment for both the Australian and State Governments with an average of over \$560 million made available annually to VicRoads (excluding government funds allocated to municipal councils) for road construction and maintenance.
Paras 4.55 to 4.59
- When compared with New South Wales and Queensland, Victoria's share of Australian Government road funding has been the lowest and has fallen from just over 20 per cent in 1995-96 to an expected 16.1 per cent in 1999-2000.
Paras 4.60 to 4.61
- Victoria's most recent funding submission to the Australian Government stated that "*Victorians contribute 25 per cent of Federal fuel excise but receive only 17 per cent of Federal road funding, in effect subsidising other states by almost \$120 million per annum*".
Paras 4.62 to 4.67
- Planning within VicRoads of individual major road construction projects involves many important steps and is generally well-managed.
Paras 4.77 to 4.95
- Some avenues are available for VicRoads to further strengthen its consultative processes with the community on major road projects.
Paras 4.96 to 4.102
- There are opportunities for the Government to enhance accountability and transparency through the issue of a periodic statement showing its intentions, in priority order, for future road construction projects and upgrading the level and quality of published information dealing with the availability and use of road funding.
Paras 4.103 to 4.111

DEVELOPING CONTRACTS FOR ROAD CONSTRUCTION PROJECTS

Page 67

- Under initiatives which offer potential for lower costs and better quality outcomes, VicRoads has progressively introduced single contract packages for major projects as well as contracts where the contractor undertakes both design and construct tasks.
Paras 5.9 to 5.19
- It will be important for VicRoads to progressively monitor the impact of its contract packaging initiative in areas such as cost levels, timeliness of works and overall quality of construction.
Paras 5.20 to 5.22
- VicRoads has the challenge of ensuring that the use of larger and all-encompassing contracts does not place the very large construction companies in a dominant industry position and able to exercise an increasing level of influence over smaller industry participants.
Para 5.23 to 5.28
- With contract packaging, there is likely to be better co-ordination between parties associated with the relocation of services such as water supply, power, telecommunications and gas, resulting in overall project cost savings.
Paras 5.29 to 5.34
- The contractual documentation used by VicRoads for major road construction projects is of an appropriate quality and in line with industry standards.
Paras 5.37 to 5.39
- VicRoads should be commended for the high quality of its design standards for road construction works. With the increasing devolution of responsibility for design to external contractors, VicRoads will need to ensure it maintains adequate levels of skills and expertise in order to continue its lead role in the setting and monitoring of design standards.
Paras 5.40 to 5.42
- The incorporation within contracts of output-based performance criteria such as road smoothness, skid resistance and driver safety would place VicRoads in a stronger position to assess the quality of newly-constructed roads.
Paras 5.43 to 5.47
- VicRoads should evaluate the magnitude of its overall project management costs with a view to identifying any opportunities for improving efficiency in this area.
Paras 5.50 to 5.54
- Where delays occur in the preparation of initiating reports (which include tender estimates), the capacity of VicRoads to adequately scrutinise project proposals prior to approval to proceed to tender can be significantly weakened.
Paras 5.59 to 5.62
- VicRoads needs to address weaknesses in its procedures for the development of tender estimates which are used to confirm initial budgetary allocations for contracts and to assist tender evaluation teams in their assessments of tender bids.
Paras 5.63 to 5.72

SELECTION OF CONTRACTORS

Page 85

- VicRoads has developed a 3-staged approach to the engagement of contractors incorporating, as a specific feature, a scheme for the pre-qualification of contractors.
Paras 6.11 to 6.21
- The pre-qualification scheme was found to be a comprehensive and well-managed process.
Paras 6.22 to 6.24
- VicRoads could further enhance the pre-qualification scheme through greater scrutiny of the ongoing financial viability of contractors and the inclusion of external representation on the committee responsible for overseeing operation of the scheme.
Paras 6.25 to 6.31
- The establishment of a uniform approach within government to contractor pre-qualification would, through the use of common standards, lead to better quality outcomes in construction works and lower administrative costs to both government and contractors.
Paras 6.38 to 6.40
- VicRoads is currently negotiating with the road construction industry to introduce revised procedures for the shortlisting of tenderers which should reduce costs to both VicRoads and tenderers in the tender selection process.
Paras 6.52 to 6.57
- Tendering procedures within VicRoads are well-structured and operating effectively.
Paras 6.58 to 6.62
- VicRoads could further improve its management of tendering procedures through the engagement of an external probity auditor, at least on selected major projects, to provide independent confirmation of the fairness and equity of procedures and by widening the membership of tender evaluation teams to encompass external individuals of suitable standing and expertise.
Paras 6.63 to 6.67
- Greater attention should be devoted by tender evaluation teams within VicRoads to the examination of individual cost elements documented within tender bids to, *inter alia*, identify low-priced bids or other inappropriate practices by tenderers.
Paras 6.68 to 6.74

CONTRACT MANAGEMENT

Page 105

- VicRoads manages contract variations (circumstances involving departures from planned works) in an appropriate manner and the magnitude of cost variations was found to be generally in line with industry experience.
Paras 7.10 to 7.15
- Under existing practices, VicRoads is exposed to certain risks such as the potential for increased contract payments and litigation action against it arising from aggregated claims submitted by contractors at the completion of a project.
Paras 7.18 to 7.26
- VicRoads should ensure that its contractors furnish construction programs of an acceptable standard in a timely manner and extensions of time are not granted in advance of its approval of programs.
Paras 7.27 to 7.33
- Weaknesses in the manner in which VicRoad manages on-site meetings with contractors limit its capacity to adequately monitor a contractor's performance.
Paras 7.34 to 7.37
- There is a need for a more structured approach within VicRoads to the carrying out of post-contract and post-project evaluations.
Paras 7.38 to 7.42
- VicRoads faces the important challenge of ensuring it has adequate future levels of skilled staff with the necessary hands-on road construction experience to effectively monitor the performance of contractors.
Paras 7.49 to 7.56
- To its credit, VicRoads has made very significant progress in the implementation of quality systems across its entire range of operations.
Paras 7.57 to 7.61

RELATIONSHIPS BETWEEN PRIME AND SUB-CONTRACTORS

Page 119

- Sub-contractors have expressed serious concerns with regard to tendering and contracting practices adopted by certain road construction prime contractors. The expressed concerns included allegations of highly-inappropriate payment practices and unethical behaviour in pressuring sub-contractors to renegotiate their previously-submitted prices.
Paras 8.10 to 8.31
- In March 1999, the former Government issued a revised *Code of Practice for the Building and Construction Industry* which sets out the minimum standards required of parties seeking government business in the industry.
Para. 8.38
- A wide range of suggestions for enhancing dispute resolution processes within the industry, several of which involve policy considerations for the Government, were conveyed by sub-contractors.
Paras 8.43 to 8.45
- VicRoads needs to forge closer co-operative relationships with all parties engaged in road construction projects without unduly interfering with the contractual obligations of prime contractors and subcontracting parties.
Paras 8.46 to 8.51

PERFORMANCE MEASUREMENT AND REPORTING

Page 131

- VicRoads reports on its road management activities within a framework of national performance indicators for State road authorities established by the Association of Australian and New Zealand Road Transport and Traffic Authorities (Austroads). *Paras 9.12 to 9.16*
- While the development of a national performance framework has proved to be a valuable initiative, some important qualifications have to be applied to the framework when forming judgements on the quality of Victoria's overall performance. *Paras 9.17 to 9.19*
- On the basis of information reported by Austroads, VicRoads can be considered to be performing well in planning and prioritising road construction projects expected to provide high levels of economic benefits to the community. However, because of measurement difficulties, the national framework has not, to date, presented information on the extent to which predicted benefits are ultimately realised. *Paras 9.20 to 9.38*
- Road safety on Victorian roads improved in each of the 3 years 1995, 1996 and 1997 when measured in terms of serious casualty crashes, road fatalities and persons hospitalised relative to movements in population and road usage. However, the position deteriorated in respect of all of these indicators in Victoria in 1998. *Paras 9.41 to 9.44*
- VicRoads places significant corporate emphasis on continually improving the safety of the road network, within the boundaries of its control and responsibility. *Paras 9.45 to 9.48*
- On the basis of the data reported by Austroads, Victoria can be considered to have roads which, in terms of surface smoothness, are better than, or comparable with, other Australian States. *Paras 9.49 to 9.55*
- For 1997-98 (the latest data available), around 14 per cent of Melbourne dwellings (an increase from 9 per cent in 1996-97) were exposed to traffic noise levels higher than the acceptable industry standard. This level of exposure to traffic noise was the highest of all States. *Paras 9.56 to 9.60*
- For newly-constructed roads, VicRoads has adopted a more stringent noise level requirement than the industry standard and has implemented innovative strategies aimed at meeting this higher standard. *Paras 9.61 to 9.63*
- Based on a 1998 national survey of road users conducted by AustRoads, Victoria achieved the commendable position of recording the highest level of user satisfaction. *Paras 9.64 to 9.67*
- There is significant scope for VicRoads to strengthen the line of accountability to the Parliament and the community on its periodic performance in road construction. *Paras 9.71 to 9.86*
- Several avenues are available to VicRoads for improving the usefulness of road construction output measures and targets presented within the annual budget papers. *Paras 9.87 to 9.91*

Part 2

Outline of road construction in Victoria

VICTORIA'S ROAD NETWORK

2.1 The Victorian road network is one of the State's major capital assets. The network represents approximately 18 per cent of the Government's total investment in infrastructure with expenditure in excess of \$600 million incurred annually by VicRoads and municipal councils on the construction, upgrade and maintenance of Victorian roads.

2.2 The road network comprises in excess of 160 000 kilometres of roads incorporating freeways, highways, arterial and main roads, tourist roads and forest roads. This extensive network is a significant factor contributing to the social, recreational and economic development of the State. In particular, the ability of the industrial and commercial sectors to transport products safely, quickly and at low cost within the road network is critical to the economic viability of those sectors and the economic development of the State.

2.3 At government level, responsibility for the development and maintenance of the State's road network is shared between:

- the Australian Government which:
 - has overall responsibility for the funding of *national highways*, major roads that provide significant freight travel across State borders or provide vital links to these roads; and
 - shares funding responsibility with the State for *roads of national importance* which provide major inter-regional routes within an individual State and usually pass through State borders;
- the State Government which has responsibility for remaining major arterial roads within the State, comprising freeways, State highways, forest and tourist roads, and main roads; and
- local government bodies who are responsible for local roads.

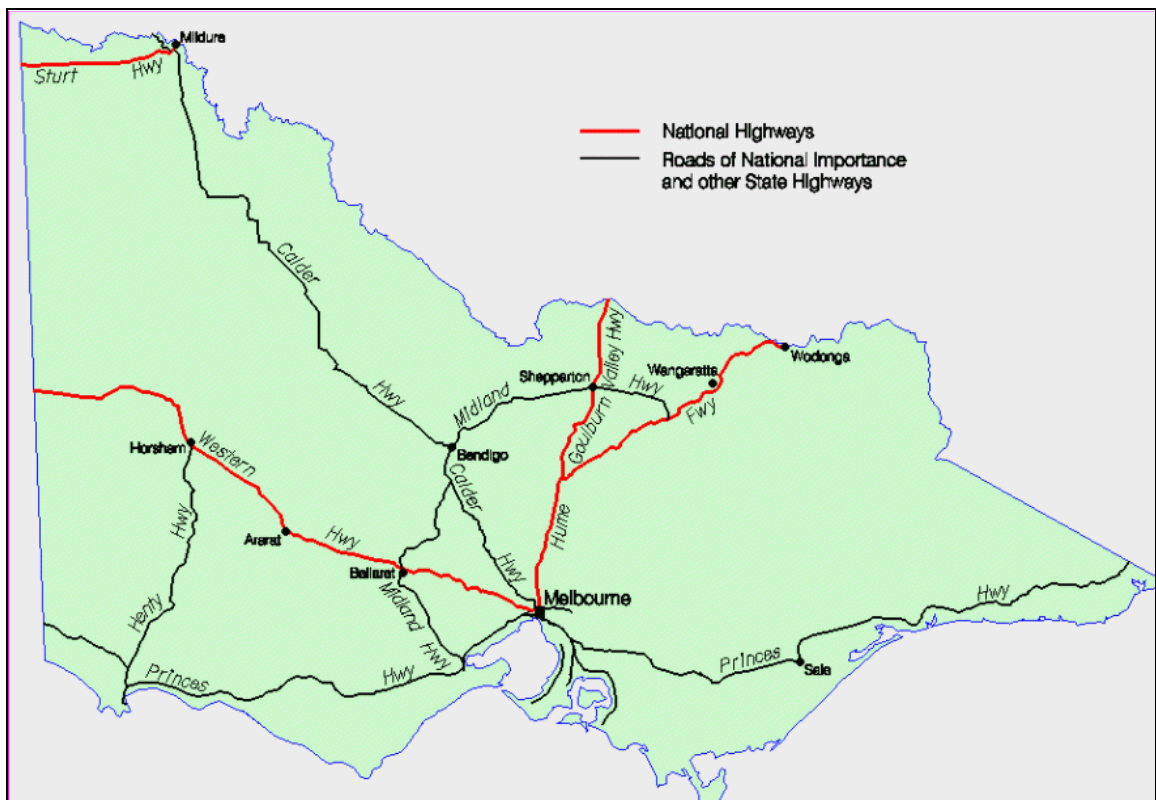
2.4 Management responsibility for all roads within Victoria (including bridges) other than local roads rests with the Roads Corporation of Victoria (VicRoads). Victoria's 78 municipal councils and shires are directly responsible for the condition and maintenance of local roads and, in the majority of cases, have been allocated responsibility from VicRoads for the management of main roads.

2.5 In addition, the Department of Infrastructure has responsibility for co-ordination of overall infrastructure and transport planning, incorporating strategic issues associated with roads.

2.6 Chart 2A outlines Victoria’s network of national highways, roads of national importance and other key State highways comprising:

- *National Highways*
 - Goulburn Valley Highway;
 - Hume Freeway;
 - Western Highway; and
 - Sturt Highway.
- *Roads of National Importance:*
 - Calder Highway.
- *Other State highways:*
 - Henty Highway;
 - Midland Highway; and
 - Princes Highway.

**CHART 2A
MAJOR ROADS IN VICTORIA**



Source: VicRoads.

VICTORIA'S ROAD CONSTRUCTION INDUSTRY

2.7 Road construction is a major component of the building and construction industry in Victoria. The industry is governed by the *Code of Practice for the Building and Construction Industry* which was introduced by the former government in July 1994 and subsequently revised in March 1999. This industry code:

- is mandatory to all parties involved in public construction including road construction;
- establishes principles and minimum standards of building and construction behaviour that underpin best practice;
- promotes high ethical standards in the industry; and
- seeks to encourage innovative practices.

2.8 In addition to various levels of government, participants in the road construction industry include:

- Prime contractors engaged by VicRoads, comprising pre-qualified private construction companies who may be involved from time-to-time in major construction projects and a number of smaller companies usually appointed to undertake less significant projects, often in regional locations; and
- A large number of entities, often with a more specialised business focus, which generally act as sub-contractors. These businesses include operating subsidiaries of large conglomerates, small businesses, suppliers of materials used in the construction process, and consultancy firms involved in design and other phases of road projects.

2.9 The total number of participants in the State's road construction industry at any point in time cannot be accurately determined. However, an indication of the size of the industry can be gleaned from the fact that over 300 entities have been involved as prime or sub-contractors on major construction projects managed by VicRoads during the last 4 years.

FUNDING OF ROAD PROJECTS

2.10 Funding for road construction and maintenance in Victoria is provided from both the Australian and State Governments. Table 2B summarises the level of government funding available for use by VicRoads (excluding funds allocated to municipal councils) over the past 3 financial years.

TABLE 2B
SOURCES OF FUNDS FOR VICTORIAN
ROAD CONSTRUCTION AND MAINTENANCE
(\$million)

Source of funds	1998-99	1997-98	1996-97
Australian Government	204.2	188.4	211.0
State Government -			
Budgetary allocations	222.4	284.4	271.1
Better Roads Victoria Program	128.7	90.7	95.6
Total funding	555.3	563.5	577.7

Source: VicRoads and the Department of Infrastructure.

2.11 Major road construction contracts (with a value in excess of \$5 million), and which have been the prime focus of this audit, have involved outlays by VicRoads of approximately \$550 million over the 3 year period 1996-97 to 1998-99.

2.12 Variations in the level of funding each year can often be attributed to the timing of major works and projects approved by government for funding from annual appropriations.

2.13 Since 1993, an additional source of funds for Victoria's road construction has been the Better Roads Victoria Program. Under this Program a new trust fund, the Better Roads Trust Fund, was established to receive a 3-cents-a-litre fuel franchise fee for application principally towards projects which contribute to economic development by reducing transport costs for business and improving the efficiency of roads. Over 50 metropolitan projects and around 480 projects in regional and rural Victoria have been funded under this initiative. Fluctuations between years in the level of funds applied from the trust fund to projects are primarily due to the timing of works, where funds may be held over from year-to-year.

ROLE OF VICROADS IN ROAD CONSTRUCTION

2.14 VicRoads has wide-ranging functions under the Victorian *Transport Act 1983* including:

- to maintain, upgrade, vary and extend the State's road network; and
- to assist in the maintenance, upgrading and construction of other roads in conjunction with local municipalities.

2.15 In performing these functions, the activities of VicRoads are organised into 3 main categories, namely:

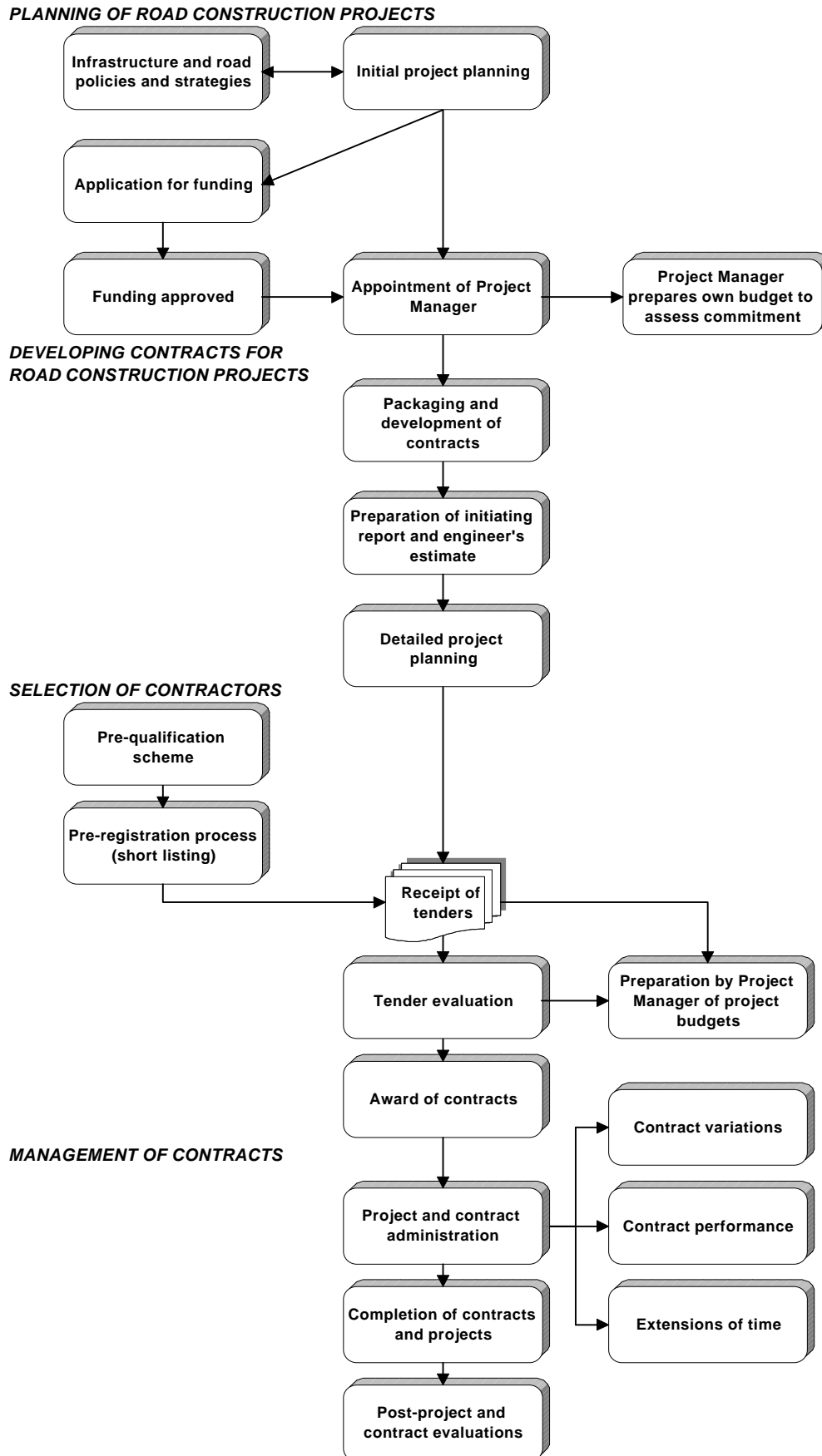
- road system management - a corporate function with the responsibility for network-wide road quality monitoring and strategic management of road maintenance programs;
- major projects management – a separate organisational unit responsible for management of road construction projects generally costing in excess of \$5 million which are planned and managed by dedicated project teams; and
- regional operations – undertaken across 7 regional units which are responsible for the monitoring and maintenance of all roads and smaller construction projects in the relevant region.

2.16 Since the early 1990s, VicRoads has adopted a policy of contracting out major road construction activities to private sector firms. In organising contracts, VicRoads generally subdivides a construction project into a number of separate contracts utilising either the same or different prime contracting firms under competitive tendering arrangements. To ensure it maintains adequate monitoring and control over projects, VicRoads relies heavily on its internal quality assurance processes and those established by the appointed contractors.

2.17 Under its outsourcing arrangements, VicRoads plays a direct role in the development of plans and specifications, selection of contractors and ongoing management of contracts. In recent years, VicRoads has increasingly moved from *construction* contracts based upon its own designs to *design and construct* contracts encompassing both design and construction.

2.18 The development of major roads can be a complex and lengthy process extending from the initial concept through to ultimate completion of construction works. Management of construction by VicRoads involves a range of co-ordinated activities comprising strategic planning for the road network, initial project planning, approval of funding, preparation of technical specifications and requirements, packaging and development of contracts, selection of contractors and the administration of contracts and construction works. In some cases, projects because of their sheer magnitude are divided into multiple stages with the various stages subject to separate funding and contractual arrangements. Chart 2C summarises, to the extent practicable, the main components of the management processes employed by VicRoads for construction projects.

**CHART 2C
KEY STAGES IN MANAGING MAJOR ROAD CONSTRUCTION PROJECTS**



2.19 An indication of the range of major road construction projects managed by VicRoads can be obtained from Table 2D which lists current major contracts and major contracts which have been completed since January 1997.

**TABLE 2D
CURRENT MAJOR ROAD CONSTRUCTION PROJECTS
AND PROJECTS COMPLETED SINCE JANUARY 1997**

<i>Project/contract</i>	<i>Contract value (\$million)</i>	<i>Date of contract award</i>	<i>Completion date</i>
Docklands Transport Infrastructure Project - Reconstruction of Dudley and Flinders Streets, North Wharf Road and Charles Grime Bridge	35.9	April 1999	September 1999
Boronia Rail Crossing	21.9	March 1997	December 1998
Calder Corridor - Black Forest Section	32.5	December 1997	February 2000
Gisborne South	18.5	May 1996	April 1998
Calder Highway - Duplication Irymple to Mildura	6.2	October 1996	October 1997
Eastern Freeway - Doncaster Road to Middleborough Road	30.8	February 1996	December 1997
Middleborough Road to Springvale Road	35.5	February 1996	December 1997
Noise walls - Bulleen Road	7.9	December 1996	November 1997
Bulleen Road to Doncaster Road	22.2	October 1995	September 1997
Exhibition Street Extension (contract manager VicRoads) - Flinders Street to Batman Avenue	19.6	October 1997	August 1999
Melton Highway - Duplication	5.1	February 1997	December 1997
Princes Freeway Interchange - Maltby Bypass Western Highway	5.1	January 1999	January 2000
Princes Highway East - Nilma Interchange	8.0	June 1999	January 2001
Darnum Interchange	5.8	December 1996	December 1997
Yarragon to Trafalgar	12.2	February 1995	May 1997
South-Eastern Freeway (now called Monash Freeway) - Bridges and interchanges	69.4	August 1994	May 1997
Western Highway - East of Kaniva	7.2	October 1997	April 1999
Kaniva	8.3	January 1996	June 1997
Westernport Highway - Duplication	15.7	March 1999	November 2000
Western Ring Road - Edgars Road to Dalton Road	24.0	October 1997	June 1999
Mahoney's Road to Edgars Road	35.6	August 1997	June 1999
Edgars Road Bridge	5.4	March 1997	March 1998
Calder Freeway Interchange	29.9	May 1995	June 1997
Tullamarine Interchange	14.1	June 1995	May 1997
Steele's Creek to Sharps Road	26.7	November 1995	May 1997
West Gate Freeway - Widening Grieve Parade to West Gate Bridge	9.9	February 1999	December 1999
Ballarat Bypass Stage 2	17.2	March 1995	February 1998

Source: VicRoads.

2.20 Over recent years, VicRoads has devoted significant resources to the establishment of quality systems in accordance with the International Standard ISO 9000, Quality Management and Quality Systems. In this regard, VicRoads has now obtained accreditation under this Standard for all its key activities including areas related to the management of major road construction projects.

Part 3

Conduct of the audit

DECISION TO CONDUCT PERFORMANCE AUDIT

3.1 As outlined in Part 2 of this Report, the management of Victoria's road network represents a major responsibility of the Australian and State Governments. Jointly, these 2 levels of government incur over \$600 million annually on the development and maintenance of the road network across the State. The extent to which this development and maintenance activity is effective can have a major impact on both the State's economy, in terms of business transport time and costs, and on wider community welfare, in areas such as travel time and road safety.

3.2 Major road construction projects under the responsibility of VicRoads are an important facet of the management of the road network. The outcomes of these major projects are a key determinant in the overall benefits achieved by business and the community from the State's road system.

3.3 Given the magnitude and importance of these activities, and the fact that they had not previously been subject to external audit examination, the Auditor-General approved a performance audit of the management of major road construction projects by VicRoads.

3.4 A further factor in the decision to undertake a performance audit was the increasing emphasis on outsourcing throughout both VicRoads and the State's public sector in recent years. In undertaking major construction projects, VicRoads has, for many years, outsourced a significant portion of work to private sector firms. The extent of reliance on the private sector has gradually increased in recent years with the advent of contracts under which private firms perform not only construction works but also the design phase of projects, an area previously undertaken by VicRoads.

3.5 Finally, the conduct of a performance audit dealing with the management of road construction was endorsed by the Parliament's Public Accounts and Estimates Committee following consultation with the Committee by the Auditor-General on annual performance audit planning, as required by the *Audit Act* 1994.

AUDIT OBJECTIVE

3.6 The overall objective of the audit was to evaluate the efficiency and effectiveness of the management of road construction projects by VicRoads. In pursuit of this overall objective, emphasis was directed towards determining whether:

- effective planning processes were in place for the identification and prioritisation of major road construction projects;
- the construction of major roads and bridges in Victoria had been managed by VicRoads with due regard to effectiveness and efficiency; and
- management by VicRoads of the relationships between prime road construction contractors and sub-contractors assisted in ensuring compliance with the code of practice for the building and construction industry and facilitated probity, fair dealings and financial stability generally within the road construction industry.

3.7 The audit also sought to give recognition to initiatives taken by VicRoads to progressively improve the quality and efficiency of its management of road construction projects.

AUDIT SCOPE

Areas covered

3.8 To achieve the objective outlined above, the scope of the audit included examination of a broad range of activities associated with major road construction projects. These activities encompassed:

- strategic planning by VicRoads of road construction and the consistency of this planning with high-level government policy and strategic directions;
- the planning of individual construction projects;
- the performance measurement framework established by VicRoads to assess the quality of construction for the State's major highways and roads;
- processes used for the selection and appointment of contractors to construction projects;
- contract and project management procedures utilised by VicRoads; and
- the role of VicRoads in ensuring:
 - the ongoing availability of appropriate contractors;
 - compliance with industry standards; and
 - the resolution of contractual disputes.

3.9 The audit analysis involved:

- examination of project, contractual and other key documentation;
- extensive discussions with management and staff of VicRoads;
- discussion with representatives of the Departments of Infrastructure and Treasury and Finance;
- consultation with representatives of industry associations, construction companies and other organisations with a stake in the Victorian road construction industry; and
- the seeking of comments and views from contractors and sub-contractors involved in the road construction industry.

3.10 The key focus of the audit was directed towards major road construction projects under the responsibility of VicRoads over the last 4 years. As such, the scope of the audit excluded road construction works within urban and rural areas of the State carried out under the responsibility of municipal councils.

Consultation with private sector contractors and sub-contractors

3.11 Following initial interviews with a small number of contractors operating in the building and construction industry, a decision was made to seek the views of a cross-section of contractors in relation to issues associated with road construction projects in the State.

3.12 In undertaking this aspect of the audit, questionnaires were developed with specialist assistance and forwarded to around 250 prime and sub-contractors involved in major projects managed by VicRoads over the last 4 years. Written responses were subsequently received from 69 contractors and face-to-face interviews were held with 24 firms covering both respondents and non-respondents to the audit questionnaires.

3.13 The consultation process covered the full range of contracting firms including multi-national companies, metropolitan, provincial and rural contractors, pre-qualified and non-pre-qualified contractors, and prime and sub-contractors. This process covered a wide range of industry specialisations including bridge builders, technical specialists, plant and equipment hire companies, material suppliers, and engineering and technical consultants.

3.14 The information provided by contractors during the consultative process led to the identification of a range of issues considered to be of importance by participants in the road construction industry.

Compliance with auditing standards

3.15 The audit was performed in accordance with Australian Auditing Standards applicable to performance audits and accordingly included such tests and other procedures considered necessary in the circumstances.

RESOURCING OF THE AUDIT

Appointment of Audit Victoria to conduct the audit

3.16 As a consequence of amendments to the *Audit Act* 1994, passed by the Parliament in December 1997, the Auditor-General has been required to appoint *authorised persons*, following a process of contestability, to assist in the carrying out of both financial and performance audits. A new government statutory body, Audit Victoria, operating under a Board of Directors appointed by the Government, was established within the legislation to participate in this contestability process along with private sector service providers.

3.17 For performance audits in progress, the amended legislation provided the Auditor-General with the option of utilising the Auditor-General's Office to continue to conduct the audits or assigning remaining tasks to Audit Victoria. In this regard, the Auditor-General determined to appoint Audit Victoria to undertake the field work for this particular audit and prepare an audit report which could be considered for presentation to the Parliament.

3.18 While Audit Victoria was appointed to conduct the audit field work and prepare a report on the results of the audit, the Auditor-General remained solely responsible for this final Report tabled in the Parliament.

Specialists engaged

3.19 In addition to its own performance audit resources, Audit Victoria engaged specialists in the following areas to assist in the conduct of the audit and in the preparation of its report to the Auditor-General:

- performance measurement framework for road construction and assessment of the condition and maintenance of roads - Professor Arun Kumar, RMIT University;
- standard contractual documentation utilised by VicRoads - Associate Professor Dennis Green, RMIT University;
- quality assurance processes associated with road construction - Ms Norine Cruse of Cruse and Associates;
- project and contract management processes - Mr Reg Hobbs and Mr Randolph Creswell of Flagstaff Consulting Group Pty Ltd, Mr John Goodman, consultant and Mr John Noonan and Mr Robert Stamp of Sinclair Knight Merz; and
- development and evaluation of audit questionnaires forwarded to contractors - Mr Neil Day, University of Melbourne.

ASSISTANCE PROVIDED

3.20 Significant support and assistance was provided to audit by the management and staff of VicRoads. Audit wishes to acknowledge the contribution that this assistance made to the preparation of material for this Report.

3.21 Audit also wishes to express its appreciation to the Department of Infrastructure, the Department of Treasury and Finance, the Victorian Chapter of the Institute of Arbitrators and Mediators of Australia, the Civil Contractors Federation, and those companies and organisations which responded to the audit questionnaire forwarded to contractors or otherwise contributed to the audit.

Part 4

Strategic planning for road construction

OVERVIEW

4.1 VicRoads operates within a comprehensive planning framework for road construction which:

- facilitates a co-ordinated approach within the State to strategic planning for roads;
- enables integration of planning with higher-level infrastructure and transport policies; and
- assists in the prioritisation of individual road construction projects.

4.2 These 3 features have contributed to effective planning for major road projects managed by VicRoads.

4.3 There are 2 opportunities for the Government to enhance accountability and transparency in this major area impacting on the State's infrastructure.

4.4 Firstly, there is an absence of a published strategic plan for road construction within the State which shows, in a consolidated form, the priority ranking assigned by government to individual projects.

4.5 It is considered that a strategic plan of this nature should be compiled by the Government and presented to the Parliament on a periodic basis. The plan should identify any changes in ranking of projects since the previous plan and the reasons for such changes. The magnitude of public funds consumed in road construction and the importance of road infrastructure to Victoria's economy reinforce the value of any action taken to upgrade the transparency of decision-making in this area.

4.6 Secondly, there is clear scope for the Government to upgrade the level and quality of published information dealing with the availability and use of road funding. Presentation to the Parliament of an annual consolidated statement showing, for the preceding financial year, the key sources of funding (encompassing allocations by the Australian and State Governments) and the manner in which funds have been applied within the State (such as under the Better Roads Victoria Program) would also strengthen accountability and transparency for this major area of government activity.

4.7 In 1994 and 1996, VicRoads developed 2 road strategies, *Linking Melbourne* and *Linking Victoria*, which document plans for improving metropolitan and rural roads. VicRoads has the key challenge of updating these strategies in order to achieve greater consistency with the State's broader transport policies and emerging metropolitan and rural road needs.

4.8 The Department of Infrastructure has responsibility for overall co-ordination of infrastructure strategies, incorporating transport planning, within Victoria. A pressing need for the Department is to rectify the delay which has occurred in finalising an overall transport strategy for rural regions. Preparation of a document, *Transporting Victoria*, commenced in 1996 but it still remains in draft form. High priority should be directed to having in place an appropriate up to date strategic framework for addressing transport needs within rural areas.

OVERVIEW - continued

4.9 In a positive initiative, the Department has commenced a program of infrastructure reviews at municipal level, in conjunction with municipal councils and VicRoads. The aim of these reviews is to develop specific regional strategies which address the needs of a single municipality or a cluster of adjacent municipalities. To date, one regional strategy has been completed and 2 others are nearing finalisation. Based on current timeframes, strategies for all municipal regions warranting a review will not be completed for several years. The Department should consider fast-tracking the completion of regional strategies to augment future planning and prioritisation of road projects in identified regional areas.

4.10 The funding of road strategies represents a major investment for both the Australian and State Governments. An average of over \$560 million has been made available annually to VicRoads (that is excluding government funds allocated to municipal councils) for road construction and maintenance over the 3 year period 1996-97 to 1998-99.

4.11 New South Wales, Queensland and Victoria have over recent years received approximately 70 per cent of aggregate road funding distributed by the Australian Government. Since 1996-97, Victoria's share of road funding has been the lowest of the 3 states and has fallen from just over 20 per cent in 1995-96 to an expected 16.1 per cent in 1999-2000. An analysis of the underlying data indicates that the funding comparison is particularly striking for national highways. For these highways, Victoria's share has progressively decreased from 14.4 per cent in 1996-97 to 10 per cent in 1999-2000, a level much lower than Queensland's share of 24 per cent and that of New South Wales of about 32 per cent.

4.12 Victoria's most recent funding submission to the Australian Government drew attention to this significant funding imbalance and stated that "*Victorians contribute 25 per cent of Federal fuel excise but receive only 17 per cent of Federal road funding, in effect subsidising other States by almost \$120 million per annum.*"

4.13 It would seem, from discussions with the federal Department of Transport and Regional Services, that Victoria's comparatively low level of federal road funding is unlikely to change in the near future. The Department indicated that the State's funding allocation reflects the Australian Government's view that national highways and roads of national importance in Victoria have now been assessed to be largely completed to an appropriate standard.

INTRODUCTION

4.14 Effective planning for road construction requires:

- high-level policies and strategies aimed at meeting current and future needs for the road system which are co-ordinated with the Government's broader economic and social strategies;
- a structured and transparent process in place for the development of periodic strategic road construction plans for the State which identify the key priorities for construction projects and associated preliminary financial commitments; and
- project planning within VicRoads, which provides a sound basis for prioritising and funding specific projects, addressing community and environmental requirements and ensuring that the outcomes envisaged in high-level policies are achieved.

4.15 Effective planning also requires:

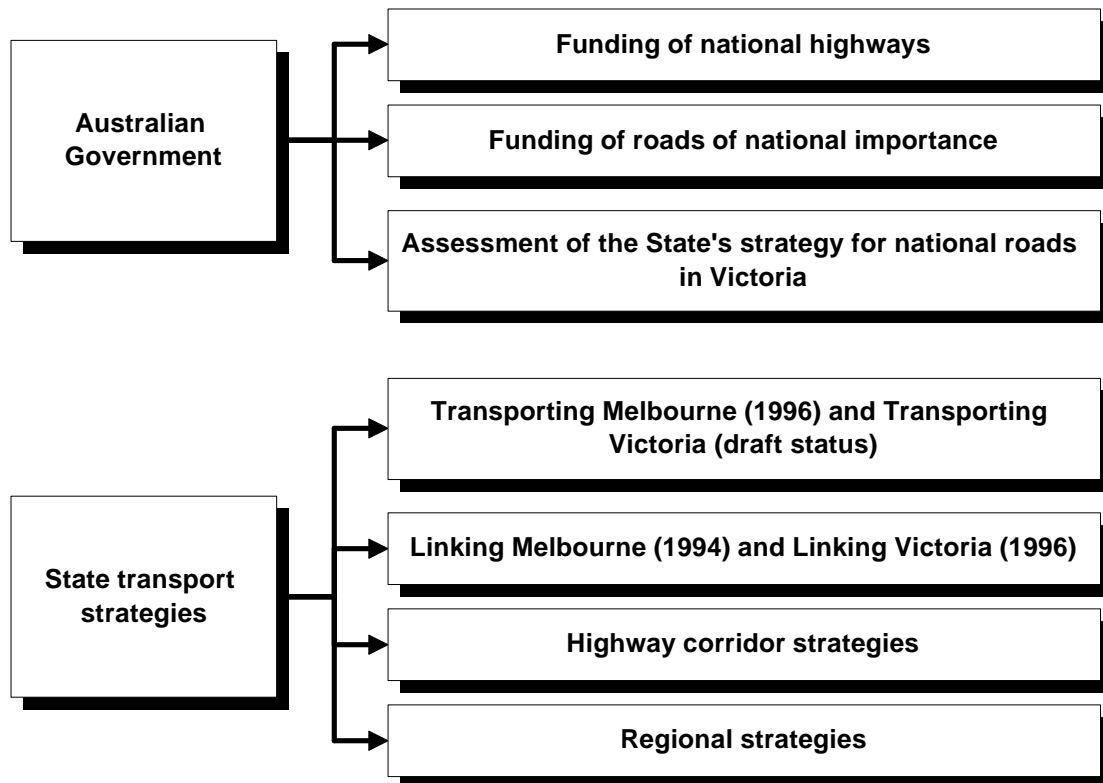
- adequate integration and co-ordination of the above 3 elements to ensure appropriate decision-making and efficient use of resources; and
- ongoing re-assessment at a high level of the consequences of any changes to the State's overall transport strategies, and monitoring at an operational level of such matters as variations in traffic patterns and emerging road construction needs in specific areas.

4.16 Planning is further influenced by the fact that timeframes from initial project conception through to project completion can vary with single stage projects generally taking up to 2 to 3 years and large multi-stage projects, such as the Western Ring Road, 10 years or longer.

STRATEGIC PLANNING FRAMEWORK FOR ROAD CONSTRUCTION

4.17 The high-level strategic planning framework in place in Victoria for the construction of roads involves participation by both the Australian and State Governments. The key elements of this participation are summarised in Chart 4A.

**CHART 4A
KEY ELEMENTS OF THE STRATEGIC PLANNING FRAMEWORK
FOR VICTORIAN ROAD CONSTRUCTION**



4.18 The commentary presented within this Part illustrates that VicRoads operates within a comprehensive planning framework for road construction which:

- facilitates a co-ordinated approach within the State to strategic planning for roads;
- enables integration of planning with higher-level infrastructure and transport policies; and
- assists in the prioritisation of individual road construction projects.

4.19 These 3 features have contributed to effective planning for major road projects managed by VicRoads.

Australian Government strategies for the national road system

4.20 Road policy and planning at a national level is concentrated on *national highways*, which are declared in the *Australian Land Transport Development Act 1988* and *roads of national importance* which are declared at the discretion of the federal Minister for Transport and Regional Services.

National highways

4.21 National highways provide the key links between significant population centres within Australia. The Australian Government has sole responsibility for the approval and funding of projects within the national highway system. The States and Territories act as the Australian Government's agents in managing and delivering road projects on national highways.

Roads of national importance

4.22 The Australian Government introduced the *roads of national importance* category in 1996 in recognition of the fact that many of the roads producing national benefits fell outside the declared national highway system. Construction projects on these roads are jointly funded, generally on an equal basis, with State governments.

Strategy for national roads in Victoria

4.23 The Australian Government requires each State and Territory to submit annually a strategy for the National Highways and Roads of National Importance within its jurisdiction covering the next 5 years. These strategies constitute the respective State bids for Australian Government road funding.

4.24 The specific strategies and proposed plans relating to national roads in Victoria are developed by VicRoads, in consultation with the Australian Government. A strategy is prepared annually by VicRoads on behalf of the State Government and presents a recommended plan to address high priority road system needs within Victoria and to contribute to the nation's economic growth strategies over the forward 5 year period.

4.25 Following consideration of submissions from all States, the Federal Minister determines priorities in accordance with the level of funding likely to be available and criteria which include a benefit-cost ratio, assessment of environmental impact and contribution to regional development and safety improvements. States are initially informed of the outcome of these deliberations, and their likely funding, pending approval of funds by federal cabinet and inclusion within the federal budget papers.

Latest submission to the Australian Government

4.26 The most recent strategic document relating to Victoria is the *National Roads in Victoria - Forward Strategy 1999-00 to 2003-04*. The proposed plan includes proposals for projects on already declared National Highways and Roads of National Importance, as well as certain projects considered by the State to be of national importance.

4.27 The 5 key elements of this strategy, as proposed by the State and submitted to the Australian Government early in 1999, were:

- “*developing key rural routes*”, particularly the Princes Highway West (Geelong Road) and Princes Highway East (specific projects such as the Pakenham Bypass) and the Calder Highway;
- “*removing bottlenecks*” on the Hume, Western and Princes Highways on the outskirts of Melbourne which currently hinder access to markets, ports and airports;
- “*completing rural National Highways*”, with the main proposed project involving duplication of the Goulburn Valley Highway;
- “*responsible asset management*”, where pavement reconstruction on the Western Highway was the prime proposal; and
- “*linking with industry and exports*”, relating to the commencement of construction of an eastern section of a future Metropolitan Ring Road (initially from Ringwood to Burwood and eventually connecting the South-Eastern Freeway and Frankston).

Response by the Australian Government

4.28 The Australian Government responded to this proposed plan in May 1999 with an announcement of indicative funding for 1999-2000 and the 3 succeeding financial years to 2002-2003. It advised the State Government that, inter alia, an amount of \$414.5 million had been allocated to Victoria over this period under the National Highway and Roads of National Importance program, with \$81.3 million to be provided in 1999-2000.

4.29 Table 4B lists all approved projects and compares the amount sought by the State with federal funding allocations.

TABLE 4B
AUSTRALIAN GOVERNMENT ALLOCATION OF FUNDS FOR ROAD CONSTRUCTION,
1999-2000 TO 2002-03
(\$million)

	<i>Federal 4-year funding 1999-2000 to 2002-03</i>	
	<i>Funding sought</i>	<i>Funding allocation</i>
<i>Proposed works</i>		
National Highway Development		
Goulburn Valley Highway –		
Seymour to Nagambie duplication	37.6	37.6
Murchison East duplication and other works	90.0	31.0
Planning studies	7.0	2.9
Western Highway –		
Deer Park to Hopkins Road	12.3	12.3
Ballarat to South Australian border – widening projects	8.0	8.0
Overtaking lanes Stawell to South Australian border	4.0	4.0
Hume Freeway –		40
Craigieburn Bypass - new freeway link to Western Ring Road	230	(from 2001-02)
Chiltern Bridge strengthening	2.3	2.3
Donnybrook Road intersection	12.0	12.0
Albury/Wodonga – Wodonga bypass	0	67.0
Western Ring Road –		
Current works	3.5	3.5
Maintenance	140.8	126.4
<i>Unfunded projects</i>	131.1	0
Total National Highways	678.6	346.9
Roads of National Importance		
Calder Highway		
<i>Duplication Melbourne to Bendigo</i>		
Black Forest section	6.5	9.0
Woodend Bypass	29.5	28.6
<i>Other National Roads proposed by VicRoads</i>		
Pakenham Bypass	10.0	30.0
<i>Unfunded projects</i>	366.2	0
Total Roads of National Importance and other proposed national roads	412.2	67.5
Total	1 090.8	414.5

Sources:

(i) National Roads in Victoria: Forward Strategy 1999-2000 to 2003-04.

(ii) National Highways and Roads of National Importance program allocation to Victoria. Indicative funding for 1999-2000 to 2002-03. Advice from Federal Minister for Transport and Regional Services, 10 May 1999.

4.30 Projects that were not approved for funding by the Australian Government in May 1999 largely fall into 2 categories:

- road construction projects where major expenditure will not occur before 2001-02; and

- projects which the State had sought funding under the Roads of National Importance Program, however, the relevant roads have yet to be approved by the Australian Government for inclusion within this Program (for example, the proposed re-construction of the Geelong Road).

Geelong Road reconstruction

4.31 Victoria's proposal for reconstructing the Geelong Road, which was not approved in the above submission, has been included in Victoria's annual submissions to the Australian Government since 1990-91. The former State Government announced in its 1999-2000 budget a commitment of \$118.5 million over 3 years to 2001-02 (approximately 50 per cent of estimated fund requirements) from the Better Roads Trust Fund for this project.

4.32 In August 1999, the Australian Government determined that it would provide funding towards this project on a dollar-for-dollar basis under the Roads of National Importance program up to a limit of \$120 million to be made available from 2001-02. It indicated that the funding was to be provided *"in recognition of the role Geelong Road plays in linking two of Australia's busiest ports, Melbourne and Geelong"*. It also stated that *"Clearly Geelong Road needs an upgraded carrying capacity if it is to serve Australia's export interests into the next century"* and cited the following benefits expected from the project:

- *"major companies already operating in the region stand to benefit;*
- *"other emerging industries such as the export of perishable produce from Avalon airport will also get a head start;*
- *"it is expected that federal funding of Geelong Road ... will create up to 4,500 jobs half of which will be in Victoria;*
- *"huge safety benefits to every day motorists. No longer will Geelong Road be known as Victoria's most dangerous freeway"*.

4.33 The financial contribution from the Australian Government for this major project is to be provided from funds which are *"in addition to existing funds within the Federal Roads programme"*.

State transport strategies

"Transporting Melbourne" and "Transporting Victoria"

4.34 Following machinery of government changes, the Department of Infrastructure was established in April 1996. This Department was assigned responsibility for overall co-ordination of infrastructure strategies and capital projects in Victoria and the integration of transport planning within the framework of other government policies.

4.35 To date, 2 integrated transport strategies have been developed by the Department, namely:

- *Transporting Melbourne* 1996 which outlines an integrated transport strategy for the Melbourne metropolitan area; and
- *Transporting Victoria* (document has been in draft form since 1998) which proposes a similar approach for the State's rural regions.

4.36 These documents have been designed to consolidate road and public transport programs to better reflect wider government policy directions, particularly in regard to economic and environmental matters.

4.37 Preparation of *Transporting Victoria* commenced in 1996 however it still remains in draft form. High priority should be directed by the Department to the finalisation of a strategy, given the importance of having in place a strategic framework for addressing transport needs within rural regions of the State.

“Linking Melbourne” and “Linking Victoria”

4.38 VicRoads, has over many years, undertaken long-term planning for managing and developing Victoria’s road network. Until the development of the transport strategies outlined in the preceding paragraphs, VicRoads carried out planning without the benefit of an integrated transport planning framework for the State.

4.39 In 1994 and 1996, VicRoads developed strategies which outline planned improvements to the metropolitan and rural road networks. These strategies, *Linking Melbourne* and *Linking Victoria*, were developed prior to the compilation of *Transporting Melbourne* and *Transporting Victoria*. Table 4C summarises the key elements of the *Linking Melbourne* and *Linking Victoria* documents.

**TABLE 4C
KEY ELEMENTS OF LINKING MELBOURNE AND LINKING VICTORIA STRATEGIES**

Linking Melbourne	
1.	Link and upgrade strategic roads to provide a continuous principal road network which contributes to trade, economic and metropolitan development including: <ul style="list-style-type: none"> • completing the Western Ring Road • joining the South Eastern, West gate and Tullamarine Freeways (a) • developing a northern city bypass route to link eastern and western suburbs • developing the Hallam and Pakenham sections of the Princes Freeway • determining the most appropriate means for developing: <ul style="list-style-type: none"> • an Eastern Ring Road • linkage to the Western Ring Road.
2.	Provide a complementary network of major regional roads which support regional access needs, including: <ul style="list-style-type: none"> • improving the capacity of congested regional roads • continued upgrading of key regional highways • developing regional transport plans for developing outer areas of Melbourne.
3.	Manage major roads so they operate effectively, efficiently and safely through: <ul style="list-style-type: none"> • improving traffic flow on major roads to increase efficiency and safety and reduce environmental impacts • making better use of roads by introducing additional transit and bus lanes along busy corridors • investigating the provision of public transport facilities on new roads.

(a) This element of the strategy has been implemented through the City Link project.

TABLE 4C
KEY ELEMENTS OF LINKING MELBOURNE AND LINKING VICTORIA STRATEGIES - continued

Linking Victoria	
1.	Develop a road network that is easy for motorists to use - a simple route marking and numbering scheme.
2.	Improve access between regions by continuous sealed 2 lane roads suitable for freight and tourist traffic.
3.	Provide additional capacity on major roads - highways with high traffic volumes will be progressively upgraded to freeway standard. Other major roads will be upgraded to reflect the amount and type of traffic they carry.
4.	Make rural travel safer - the incidence, severity and cost of road crashes in rural areas will be cut by measures to improve road conditions and to promote safer driving.
5.	Reduce freight costs - links in the arterial road network will be upgraded to improve access for freight vehicles.
6.	Improve road facilities for tourists - tourist travel will be made easier and more enjoyable through network improvements, improved route information, predictable road conditions and better signs.
7.	Protect and enhance the environment - environmental management will be integral to all VicRoads work. Sensitive areas will be protected.

4.40 Two key challenges for VicRoads are to review and update its *Linking Melbourne* and *Linking Victoria* strategies to ensure consistency in all aspects with the broader State transport framework and emerging metropolitan and regional road needs and priorities.

4.41 Comments on the extent of achievement by VicRoads under the strategies outlined in the *Linking Melbourne* and *Linking Victoria* documents are presented later in this Part of this report.

Highway corridor strategies

4.42 Since 1992, VicRoads has been progressively preparing individual highway strategies for all major highway routes in Victoria. These strategies are intended to provide, for each major highway, a greater level of detail than shown in the *Linking Victoria* document. The purpose of these strategies, as documented by VicRoads, is to "... establish for 10 to 15 year periods, future travel demands, needs and priorities for significant improvements", and to "... identify the works necessary to bring each highway up to the "Linking Victoria" performance standards".

4.43 To date, VicRoads has released 5 corridor strategies. The key initiatives identified for each strategy are set out below:

- Goulburn Valley Highway (published 1993) where "Key initiatives include the upgrading of the present two-lane, two-way highway to provide a four-lane divided highway from the Hume Freeway near Seymour through Shepparton. North of Shepparton, safety improvements, additional overtaking lanes and a deviation at Strathmerton are proposed.";
- Calder Highway (1995) where "Key initiatives include provision of a four-lane divided freeway between Melbourne and Kyneton, provision of a four-lane divided highway between Kyneton and Bendigo in a reservation suitable for conversion to freeway standard in the longer term. Between Bendigo and Mildura the highway will be developed to 'A' road standards with adequate overtaking opportunities".;

- Princes Highway East (1997) where “Key initiatives include the development of a freeway between Dandenong and Traralgon, bypasses of Hallam and Pakenham, improvements to the amenity of Lakes Entrance and improvements to the route through Bruthen (route 620).”;
- Northern Highway (1998) where “Key initiatives include the improvement of overtaking opportunities between Wallan and Heathcote, minor improvements to the alignment and works to reduce flooding. In the longer term the strategy supports highway duplication between the Hume Freeway and Kilmore.”; and
- Sunraysia Highway (1998) where “Key projects include the widening of pavements and shoulders to meet 'B' road standards, the strengthening of bridges to meet mass limits review requirements, a number of safety improvement projects and planning studies”.

4.44 The reference to “A” and “B” road standards in 2 of the corridor strategies represents route markings established by VicRoads to reflect the quality and function of rural roads. “A” category roads are single carriageways which provide primary road links between capital cities and major regional centres. “B” roads provide the primary link between major regions not served by “A” roads, and significant tourist regions.

4.45 The road construction works associated with the above corridor strategies are at various stages of completion. In relation to the earlier strategies (for example the Goulburn Valley Highway), construction of proposed works is well underway for the Hume Highway to Nagambie duplication which is due to open in early 2001. For the more recently released strategies such as the Northern Highway, planning investigations have been funded in 1999-2000 for the highway duplication between the Hume Highway and Kilmore, and for the Kilmore Bypass.

4.46 The initiatives identified under the various corridor strategies include projects that fall within both Australian and State Government funding responsibility. However, the inclusion of the initiatives in the strategies does not automatically imply that the relevant government approval has been or will be granted.



Upgrading principal road links between major provincial centres reduces travel time and costs, as well as improving safety and reliability.

Regional strategies

4.47 The Department of Infrastructure has commenced a program of infrastructure reviews at municipal level, in conjunction with municipal councils and VicRoads, with the aim of developing specific *regional strategies* which address the needs of a single municipality or a cluster of adjacent municipalities. These reviews are aimed at assessing the current infrastructure needs of specific regions, including local transport needs across all modes of transport, and defining the action and projects required to address these needs over the next 5 to 15 years.

4.48 The Department advised that the need for these reviews resulted from recognition of the previous unstructured approach for submissions by local municipalities on major works and the resulting difficulty for the Department in prioritising submitted projects.

4.49 To date, one regional strategy relating to the Casey municipality has been completed. Five other reviews are currently in progress including one addressing the needs of Whittlesea and another covering a region incorporating the municipalities of Melton, Brimbank and Wyndham Councils, both nearing completion. Further reviews are intended to be initiated in an ongoing program on a needs basis, taking into account input from councils, VicRoads and other relevant sources. The scheduling of these reviews is established by the Department as part of its annual business planning process. However, based on current timetables, strategies for all municipal regions warranting such reviews will not be completed for several years.

4.50 The departmental initiative to develop regional strategies represents a positive step towards ensuring that regional needs are appropriately recognised within State priorities. Given the importance of these strategies to future planning and prioritisation of road projects in regional areas, the Department should consider fast-tracking the completion of strategies in regions where a need has been recognised.

Strategies and performance targets in corporate plan

4.51 An important source of information on planning by VicRoads for future major road construction projects is its corporate plan, which currently covers the period 1998-2000. This plan outlines a 3 year forward plan and related initiatives and target implementation dates covering all activities of VicRoads.

4.52 Within the corporate plan, initiatives related to road construction activities are largely presented in a section outlining strategies for management of the road system. These initiatives are aimed at contributing to economic and regional development by improving community mobility, reducing travel costs and providing road users with safe, reliable and efficient road conditions. Road construction initiatives are outlined within the plan under 3 distinct categories, namely:

- urban development aimed at meeting the objectives outlined in the *Transporting Melbourne* and *Linking Melbourne* strategies, particularly in relation to the areas identified as warranting attention within the metropolitan road network such as a need for improved linkages within Melbourne's freeway network;
- rural development involving improved road linkages between country Victoria and Melbourne and between various regional areas; and
- program development and management which incorporates the development of major works for designated strategic road networks identified in *Linking Victoria*, *Transporting Melbourne* and *Linking Melbourne*.

4.53 Specific initiatives included in the corporate plan, together with the current status of the implementation of these initiatives, are outlined in Table 4D.

**TABLE 4D
STATUS OF ROAD CONSTRUCTION INITIATIVES
CORPORATE PLAN, 1998-2000**

<i>Initiatives</i>	<i>Expected timing</i>	<i>Status of project at October 1999</i>
<p>Urban development <i>Assist major cross-town movements by further network development</i></p> <p>Completion of the Metropolitan Ring Road, Hume Highway to Thomastown</p> <p>Develop a business case for government approval and funding to commence construction of the:</p> <ul style="list-style-type: none"> • Eastern Freeway extension Springvale Road to Ringwood; • Scoresby Freeway between Ringwood and Frankston; and • Widening of West Gate Freeway between the West Gate Bridge and the Western Ring Road. <p><i>Link the country to the city</i></p> <p>Finalise planning and seek Commonwealth funding for construction of:</p> <ul style="list-style-type: none"> • Hume Freeway north of Craigieburn to the Metropolitan Ring Road; and • Western Freeway from Rockbank to the Western Ring Road. <p>Develop a business case for Government approval of the Hallam Bypass on Princes Highway</p> <p>Complete duplication of the Westernport Highway from the South Gippsland Freeway to the Frankston-Cranbourne Road</p> <p>Commence planning for the Mornington Peninsula Freeway bypass of Frankston</p>	<p>4th quarter 1999</p> <p>1st quarter 1998</p> <p>2nd quarter 1998</p> <p>1st quarter 1998</p> <p>2nd quarter 1998</p> <p>1st quarter 1998</p> <p>1st quarter 1998</p> <p>4th quarter 1999</p>	<p>Opened to traffic 3rd quarter 1999.</p> <p>Project budget provided in 1999-2000.</p> <p>Report of planning panel released September 1999 – to be assessed by the Government.</p> <p>Contract let early 1999. Scheduled completion date December 1999.</p> <p>Pending report of planning review panel to Minister for Planning. Timing of construction will depend on planning approval and federal funding.</p> <p>Project budget provided to commence during 1999-2000, completion date 2004.</p> <p>Project budget provided 1998-99, completion expected in 2001.</p> <p>Traffic study proposed by the incoming Government.</p>
<p>Rural development</p> <p>Upgrade links between Melbourne and major provincial centres as per <i>Linking Victoria</i>:</p> <ul style="list-style-type: none"> • Develop a business case for Commonwealth approval to upgrade the Goulburn Valley Highway between Seymour and Shepparton; 	<p>1st quarter 1998</p>	<p>Construction of duplication between Seymour and Nagambie in progress. Expected completion date early 2000.</p>

TABLE 4D
STATUS OF ROAD CONSTRUCTION INITIATIVES
CORPORATE PLAN, 1998-2000 - continued

<i>Initiatives</i>	<i>Completion target</i>	<i>Status at October 1999</i>
<ul style="list-style-type: none"> Continue upgrading the Calder Highway to freeway standard between Melbourne and Kyneton and continued planning for duplication between Kyneton and Bendigo; 	Ongoing	Bulla – Diggers Rest interchange opened March 1998 6 km Freeway section, Gisborne to South Gisborne opened April 1998. 6 km Black Forest section commenced January 1998, to be completed by June 2000. Work in progress on the Woodend Bypass.
<ul style="list-style-type: none"> Develop business case for Commonwealth approval for upgrading of Princes Hwy between Western Ring Road and Geelong (Geelong Road); Commence duplication of Bass Highway between South Gippsland Highway and Phillip Island Tourist Road; and Continue upgrading Princes Highway East to Freeway standard between Dandenong and Traralgon. 	1 st quarter 1998 2 nd quarter 1998 Ongoing	Commonwealth approved 50 per cent funding as a Road of National Importance, August 1999. Commenced mid-1998 with ongoing works through 1999 and 2000. Current construction works at Nilma Interchange.

4.54 Part 9 of this Report comments on the quality of periodic reporting by VicRoads to the Parliament on the organisation's performance in road construction activities. As mentioned in that Part, VicRoads does not communicate to the Parliament in its annual report actual progress made in pursuing these initiatives and in meeting established project targets. The inclusion by VicRoads of such specific performance information within the annual report would strengthen its line of accountability to Parliament and the community.

GOVERNMENT FUNDING FOR ROADS

Sources of funds

4.55 The funding of road strategies represents a major investment for both the Australian and State Governments. An average of over \$560 million has been made available annually to VicRoads (that is excluding government funds allocated to municipal councils) for road construction and maintenance over the 3 year period 1996-97 to 1998-99.

4.56 Funding by the Australian Government for roads encompasses:

- tied funding for construction projects on National Highways (100 per cent federal funding) and Roads of National Importance (50 per cent federal funding);
- further tied funding for specific programs such as works to reduce safety hazards at *accident blackspots*; and

- untied funds earmarked for roads as part of overall funding arrangements with the State Government.

4.57 At State Government level, the 2 main sources of funding for roads are:

- asset investment allocations through the annual budget process to VicRoads for approved construction projects; and
- funds available under the Better Roads Victoria Program equivalent to the proceeds from a 3 cents a litre fuel franchise fee (which since 1997 has been collected by the Australian Government as an excise and distributed as grants to the States).

4.58 Table 4E summarises the level of government funding which has been allocated from the above sources for use by VicRoads over the past 3 financial years.

TABLE 4E
SOURCES OF GOVERNMENT FUNDS TO VICROADS FOR
ROAD CONSTRUCTION AND MAINTENANCE
 (\$million)

Sources of funds	1998-99	1997-98	1996-97
Australian Government			
National highways -			
Construction	42.1	44.1	68.5
Asset preservation, bridge strengthening and minor works	42.7	35.8	35.9
Roads of national importance	22.6	14.7	5.1
Road Safety - Accident blackspots	8.9	7.8	8.2
Untied funds for roads managed by VicRoads	87.9	86.0	93.3
Total Australian Government funding	204.2	188.4	211.0
State Government			
Budgetary allocation to VicRoads	222.4	284.4	271.1
Better roads Victoria program -			
VicRoads	128.7	90.7	95.6
Total State Government funding	351.1	375.1	366.7
Total funding	555.3	563.5	577.7

Sources: VicRoads and Department of Infrastructure.

4.59 It is emphasised that the above table reflects funds made available to VicRoads and therefore excludes road funding allocated by government to municipal councils.

Analysis of Australian Government road funding

Victoria's share of Australian Government funding relative to other States

4.60 Table 4F summarises the distribution of aggregate Australian Government road funding (including funds provided to councils for local roads) to the 3 States which receive approximately 70 per cent of total funding, namely, New South Wales, Queensland and Victoria. The table presents data covering actual allocations over the last 4 financial years to 1998-99 and the budgeted allocation for 1999-2000.

TABLE 4F
VICTORIA'S SHARE OF AUSTRALIAN GOVERNMENT ROAD FUNDING,
1995-96 TO 1999-2000
(per cent)

Year	New South Wales	Queensland	Victoria
1995-96	33.6	20	20.1
1996-97	33.2	21.6	18.1
1997-98	34.5	20.4	16.3
1998-99	32.2	20.6	16.7
1999-2000	33.5	20.5	16.1

Source: Federal Department of Transport and Regional Services.

4.61 The above figures show that, since 1996-97, Victoria's share of funding has been the lowest of the 3 States and has fallen from just over 20 per cent in 1995-96 to an expected 16.1 per cent in 1999-2000. An analysis of the underlying data indicates that the funding comparison is particularly striking for national highways where Victoria's share has progressively fallen from 14.7 per cent in 1996-97 to 10 per cent in 1999-2000, a level much lower than Queensland's share of 25 per cent for that year and significantly lower than that of New South Wales which is about 32 per cent.

4.62 Victoria's funding submission to the Australian Government covering the period 1999-2000 to 2003-2004 commented on this low comparative share of funding in the following terms:

"Victorians contribute 25 per cent of Federal fuel excise but receive only 17 per cent of Federal road funding, in effect subsidising other states by almost \$120 million per annum."

4.63 In discussions during the audit, the federal Department of Transport and Regional Services advised that, because the fuel excise is a tax, money collected from that source by the Australian Government is simply a contribution to the overall consolidated revenue, along with other taxes and excise duties. It mentioned there should not be an expectation that revenue will be automatically allocated in direct proportion to its source.

4.64 The Department stated that the Australian Government funds road construction projects in Australia according to perceived need and appropriate criteria. It indicated that recommendations for funding submitted to the federal Minister are *"based on the priorities nominated by the States in their strategies, Commonwealth strategies and objectives for particular National Highway corridors and the overall funding available."*

4.65 By way of specific illustration, the Australian Government's 1996 Guidelines for Roads of National Importance state that *"Funding will be focused on those areas of network inadequacy where the greatest net benefits, in terms of achieving national economic and social objectives, can be secured in the shortest timeframe and be subject to accountability requirements"*. The guidelines identify specific funding criteria including:

- improving access to major centres of economic activity;
- promoting improvements in safety, efficiency and reliability;
- contributing to the achievement of environmental targets; and

- producing net economic benefits.

4.66 The federal department advised that the reduction in federal funding provided to Victoria for road construction projects over the past 4 years reflects the Australian Government's view that national highways and roads of national importance in Victoria have now been assessed to be largely completed to an appropriate standard and that greater needs exist in other States.

4.67 The relatively small size of Victoria and its road network, compared with other States, may also be a factor of relevance in determining the quantum of federal road funds allocated to Victoria, notwithstanding population size and the extent of fuel excise paid by Victorian road users.

Untied funds

4.68 Each year, as part of its overall funding arrangements with the Australian Government, Victoria receives an allocation of untied funding which can be used for road purposes at the State's discretion.

4.69 As shown in Table 4E, the level of untied funding available for use by VicRoads on roads falling within its responsibility in each of the last 3 financial years was in excess of \$90 million.

4.70 VicRoads advised that no separate accounting occurred for these untied inflows as the funding formed part of aggregate funds allocated by the State Government to VicRoads and was accounted for as part of its overall use of State Government moneys.

4.71 In June 1999, the States, Territories and the Australian Government signed an agreement relating to the reform of Commonwealth-State financial relationships. This agreement provides for the payment of all GST revenue to the States and Territories and the cessation of the financial assistance grants as from 1 July 2000. Untied road funding has, in the past, been allocated to the States as part of financial assistance grants.

Budgetary allocations at State Government level

4.72 VicRoads, in conjunction with the Department of Infrastructure, plays a lead role in the prioritisation of projects for road construction funding within Victoria.

4.73 The principal factors influencing the determination of road funding priorities are the previously-mentioned State transport strategies such as *Linking Melbourne* and *Linking Victoria* and *Transporting Melbourne* and *Transporting Victoria*.

4.74 Factors considered by VicRoads in developing road construction priorities include road safety, road conditions, traffic levels and general transport matters. The Department of Infrastructure takes into account broader issues such as economic development plans, urban growth strategies and return on investment when addressing higher level infrastructure strategies and the integration of transport planning within wider government policy directions.

4.75 In relation to the Better Roads Victoria Program, funding priorities are specifically directed towards new road construction projects which can be seen to provide clear economic and community benefits. The objective of this program is to achieve a long-term average of one-third of available funds spent on rural roads and two-thirds on roads in metropolitan Melbourne. Information provided by the Department of Infrastructure indicated that, over the last 3 financial years, around 33.7 per cent of funds had been expended on rural roads and 66.3 per cent on metropolitan roads. Details of projects funded under this program are presented annually in the State's budget information paper dealing with public sector asset investments.

4.76 All recommendations for the allocation of funds for road purposes are subject to final scrutiny and approval by the relevant Cabinet committee as part of the annual budget process. This process is aimed at ensuring that the State's road construction program is consistent with policy priorities of government within the context of established broad transport and road network strategies.

PLANNING OF INDIVIDUAL MAJOR ROAD CONSTRUCTION PROJECTS

4.77 Planning within VicRoads for individual major road construction projects comprises a series of activities including:

- developing project concepts involving identification of specific technical requirements and analysis of available options;
- defining project objectives and anticipated outcomes and benefits;
- preparing preliminary funding estimates;
- using traffic modelling to assess a project's impact in terms of traffic flow, travel times and vehicle operating costs;
- addressing environmental factors; and
- engaging in community consultation.

Development of project concepts

4.78 Concept development within VicRoads for major projects involves detailed planning to determine the most appropriate road construction solution to the transport needs identified within the previously-mentioned planning strategies. A range of options is prepared which are evaluated and compared in terms of community and environmental needs as well as economic, safety and other factors.

4.79 VicRoads evaluates each option for a proposed project, taking into account feedback received from interested parties. For those projects with environmental and community implications, for example requiring the development of Environmental Effects Statements, VicRoads makes a recommendation to the Department of Infrastructure on a preferred course of action. In situations where there are wider policy matters outside road construction such as the Docklands development, the Department is responsible for planning activities and analysis of options.

4.80 An examination of project records and discussions with relevant personnel from VicRoads and the Department indicated that a comprehensive process is followed within the 2 organisations to establish a preferred course of action for major road construction projects.

Defining project objectives and anticipated outcomes and benefits

4.81 Road construction projects are generally focused on increasing the level of safety on roads while seeking a range of economic and social benefits and minimising any adverse effects on the environment. For each road construction project, VicRoads establishes a number of specific objectives and desired outcomes. Each option identified during the concept development phase is assessed against a set of indicators representing the project's initial objectives and outcomes. Such indicators include the effects on operational traffic performance, predicted capital costs, return on investment and safety, noise and environmental implications.

4.82 As discussed in Part 9 of this Report, outcomes other than traffic impacts are generally not reviewed in detail following project completion due to perceived measurement difficulties. These difficulties include:

- the intangible nature of certain benefits (such as the expectation that construction of the Southern and Western Bypasses connecting the Tullamarine and West Gate Freeways would improve the environment around the river, gardens and entertainment precinct, optimise economic benefits and generally improve the amenity of residential areas such as North Melbourne);
- the length of time for anticipated results to eventuate following project completion; and
- the difficulty in ascertaining the impact of projects in isolation of other contributing factors such as road safety programs.

4.83 While recognising these difficulties, there would be merit in VicRoads extending its standard expected outcomes from major road construction projects to encompass a common set of key result areas such as travel reliability, traffic capacity and environmental, safety and community considerations. With this approach, measurable outcomes could be formulated within those key result areas deemed to be relevant to each specific project, in addition to objectives considered to be unique to a particular project.

4.84 This action would facilitate a more consistent and complete approach by VicRoads in selecting the optimum planning option, reviewing actual outcomes and informing the Parliament and the community on its progressive performance in road construction.

Use of traffic modelling

4.85 During the planning of projects, VicRoads uses information derived from “what if ” traffic modelling to predict the likely impacts of different project options on vehicle travel times, vehicle operating costs, road safety and social, economic and environmental factors. Traffic modelling incorporates demographic factors such as forecasts of future population and employment growth in order to attain a better understanding of future transport demands.

4.86 While VicRoads usually engages external consultants to undertake traffic modelling for its projects in rural areas, it uses its own traffic model for proposed projects in the Melbourne metropolitan area. Although there was no evidence that the use of the model had resulted in inappropriate planning decisions, an examination identified there was scope for improving the model through:

- addressing the impact on road traffic of public transport services within the model;
- benchmarking the model against other advanced modelling systems to provide ongoing assurance that the model can be regarded as in line with best practice; and
- confirming the accuracy of assumptions built into the model underpinning predicted traffic volumes by means of subsequent examination of actual traffic volumes.

4.87 These matters should be addressed by VicRoads as part of its continuous improvement strategies.

Addressing environmental factors

4.88 Consideration of environmental factors during the planning of major development projects is important in order to:

- identify and address environmental issues at an early stage;
- ensure adequate plans are in place to maintain the local environment, protect flora and fauna and prevent excessive levels of noise, air and other forms of pollution, both during and after construction; and
- avoid the likelihood of costly remedial action following completion of construction.

4.89 Within VicRoads, requirements relating to environmental issues are determined at the planning stage of a road construction project. Those projects identified as having significant environmental impacts are required under legislation to be the subject of an *Environmental Effects Statement*, a process managed by the Department of Infrastructure. Other projects are subject to less formal environmental impact studies.

4.90 Discussions during the audit with environmental, community and industry organisations and examination of relevant documentation revealed that, over recent years, VicRoads has significantly increased its focus on environmental management. In the opinion of the State's Environment Protection Authority, this focus has redressed the previous inadequate consideration given to the environment by VicRoads. Major initiatives undertaken by VicRoads have included:

- identification in its 1998-2000 corporate plan of a key corporate aim "*to protect the environment through responsible planning and management of the transport network.*";
- a commitment within its Environmental Protection Policy issued in 1998 to protect the environment through responsible planning and management of the transport network supported by Project Management Guidelines for Environmental Protection for application by project teams on road construction projects; and
- entering into a memorandum of understanding in 1998 with the Environment Protection Authority for addressing environmental issues.

4.91 Since 1996, VicRoads has required prospective contractors seeking pre-qualification status to provide evidence that they have appropriate environmental management systems in place. In addition, contractors appointed for individual construction projects are required to develop specific environmental management plans.

4.92 VicRoads has therefore devoted significant resources to improving its environmental protection and management activities and has developed appropriate policies and guidelines that reflect the organisation's commitment in this important area.

4.93 In regard to the requirements placed on parties seeking pre-qualification, discussions with project managers within VicRoads as well as contractors and other industry participants indicated that, while the larger contractors have developed appropriate environmental management systems, smaller contractors were generally not as advanced in this area.

4.94 Examination of contract documentation including environment management plans, site meeting minutes and relevant correspondence on individual major contracts confirmed that major contractors on those projects were complying with environmental requirements established by VicRoads.

4.95 To further improve its capacity to ensure that its environmental goals are achieved on all projects, VicRoads should focus attention on adherence to its environmental requirements by all smaller contractors engaged in road projects.

Community consultation

4.96 In May 1997, VicRoads released its *Community Participation Strategies and Guidelines*, a comprehensive document which outlines the organisation's commitment to community consultation. The document identifies the steps to be taken in creating and establishing a community participation framework and explaining avenues available to staff for facilitating community involvement.

4.97 The strategies and guidelines require the development of a Community Liaison Plan for each major road project. Under such a plan, members of the community who are likely to be affected by a project are identified, appropriate communication strategies are determined and opportunities are provided for the community to express their views on the road development. A consultative committee, chaired by a person independent of VicRoads, is established to represent interested parties and advise on issues relating to project options.

4.98 The overall aims of VicRoads in its community liaison activities are to:

- inform all relevant parties of its planning proposals and the progress of specific projects; and
- offer opportunities for input by the community during project planning processes and the assessment of road construction options.

4.99 It was evident during the audit examination that, over recent years, VicRoads has instigated a much greater focus on community consultation. Some opportunities exist for VicRoads to further improve its consultative processes in that:

- After project concept planning, VicRoads does not seek further community input until just prior to the commencement of the project. Because a period of time will usually have elapsed by this stage (up to 10 years in extreme cases), it is likely that community views will have changed and new needs and concerns will have arisen, particularly when the intervening period is significant; and
- It does not presently evaluate whether information it provides is adequate and suitable for members of the community or other interested parties and it does not assess the appropriateness of the methods used to disseminate material to the external parties.



Community consultation and participation were features of the development of Melbourne's Eastern Freeway.

4.100 In relation to the initial point, there is little opportunity for public input to affect the planned works at the commencement of projects as, by this stage, all necessary approvals would have been received and appointed contractors would be ready to commence works. As a result, members of the community may well consider VicRoads to be insensitive to local concerns.

4.101 With regard to the second issue, Part 9 of this Report identifies that the line of accountability of VicRoads to the Parliament and community would be enhanced if it included in its annual report:

- the results of regular community surveys outlining the general levels of external satisfaction with the performance of the organisation; and
- additional relevant information on each project such as the level of community consultation and the extent to which any concerns arising from this consultation have been satisfied.

4.102 VicRoads should pursue the above opportunities as a means of further strengthening its consultative processes with the community.

OPPORTUNITIES FOR ENHANCED ACCOUNTABILITY AND TRANSPARENCY

Need for a periodic statement of government intentions for future road construction

4.103 Discussions within the previous paragraphs of this Part of the Report have addressed the strategic planning framework in place within Victoria for road construction. The commentary has focused on planning and funding strategies established by the Australian and State Governments and the factors taken into account in prioritising identified road projects and determining funding allocations.

4.104 A range of information is publicly available on particular aspects of road planning and funding strategies within Victoria, for example the State's documented transport strategies, its annual 5 year forward submission to the Australian Government, the corporate plan of VicRoads and annual budget information papers. However, there is currently an absence of a strategic plan for road construction within the State which shows the priority ranking for individual projects, both current and projected, and any associated financial commitments.

4.105 It is considered that a strategic plan should be compiled and presented to the Parliament on a periodic basis (say every 3 years). The periodic plan should identify any changes in ranking of projects since the previous plan and the reasons for such changes. The magnitude of public funds consumed in road construction and the importance of road infrastructure to Victoria's economy reinforce the need for such a plan.

4.106 The strategic plan should enable, through a transparent process, the integration of high-level decision-making at both State and Australian Government level into a structured document which reinforces government accountability in this important area of service delivery, while at the same time recognising the unique nature and long lead times of major road construction projects. It should also help to improve the level of community understanding of the future intentions of government to enhance Victoria's road infrastructure.

4.107 VicRoads has recently advised that it is in the final stages of formulating a document entitled *Program Development Guidelines 2000-2001* which contains information on the State's road programs, including a listing of current project commitments. This document which, following ministerial approval, will be publicly available would constitute a useful basis for compilation of the higher level strategic plan referred to in the above paragraphs.

Scope for better informing the Parliament and community on availability and use of road funding

4.108 Table 4E presented earlier in this Part summarised the level of road funding which has been allocated by the Australian and State Governments and available for use by VicRoads over the past 3 financial years. The information shown in that table was brought together during the audit from records held within VicRoads and the Department of Infrastructure. This data on the quantum of available road funding is not routinely prepared in a consolidated form for periodic presentation to the Parliament. Similarly, consolidated information showing how available funding has actually been applied within the State each financial year is not made available to the Parliament.

4.109 It should be mentioned that annual estimated expenditure under individual approved road projects is presented in the State's budget information paper dealing with public sector asset investments. However, this information on budgeted outlays is quite voluminous and does not show in a consolidated manner the sources of funding and the level of anticipated expenditure from each source. Also, many of the category headings relating to State funding used within the document to group projects would be difficult for the lay-reader to comprehend or differentiate between categories, given that suitable definitions are not included in the document. Some examples of the category headings are provided below:

- Better Roads- Rural Arterial Road Projects;
- Better Roads - Rural Arterial Road Reconstruction Projects;
- Better Roads - Rural State Impacted Local Roads;
- State Major Network Improvements; and
- Metro Major Network Improvement Projects.

4.110 There is, therefore, clear scope for the Victorian Government to upgrade the level and quality of published information dealing with the availability and use of road funding. Presentation to the Parliament of an annual consolidated statement showing, for the preceding financial year, the key sources of funding (encompassing allocations by the Australian and State Governments) and the manner in which funds have been applied within the State (such as under the Better Roads Victoria Program) would strengthen accountability and transparency for this major area of government activity.

4.111 The data contained in the annual consolidated statement should be capable of reconciliation with anticipated expenditure on road funding incorporated within the annual budget papers. Currently, it is virtually impossible to identify any links between the published budget figures and related actual expenditure on roads within the State. Attention should also be directed to improving the understandability of project categories and terminology to better meet the information needs of Parliament and the community.

4.112 On a broader point, the Government should also examine the adequacy of the reporting of the availability and use of funds in other major areas of service delivery within the public sector. This issue is likely to be relevant to those areas involving both federal and state funding.

□ **RESPONSE** provided by the Chief Executive of VicRoads

Strategic Planning Framework for Road Construction

VicRoads has already commenced a review of the Linking Melbourne strategy which was established in 1994. Significant progress has been made towards implementation of the strategy over the past five years.

Government Funding for Roads

In developing road network and corridor strategies and consequential programs for road improvements VicRoads takes into account the return on investment and broader economic and regional development issues. (Refer Paragraph 4.74)

Planning for Individual Major Road Construction Projects

Defining project objectives and anticipated outcomes and benefits

All major projects are subject to a planning process which clearly identifies traffic performance requirements (traffic volumes and road capacity), road safety performance, and environmental objectives and standards.

During construction environmental performance is audited against objectives through the development and application of Environmental Management Plans, and projects are subject to rigorous road safety audits at the design stage and prior to opening to traffic.

VicRoads systematically measures and monitors road conditions, traffic flows and accidents on all arterial roads, including new roads.

- ❑ **RESPONSE** provided by the Chief Executive of VicRoads - continued

The use of traffic modelling

VicRoads transport modelling is benchmarked against other modelling systems where these are available (for example in the planning report for the new Hume Freeway link between the Western Ring Road and Craigieburn)

Actual traffic volumes are compared with predicted volumes.

VicRoads works in close collaboration with the Department of Infrastructure in progressively adapting and improving transport modelling.

Part 5

Developing contracts for road construction projects

OVERVIEW

5.1 Since the early 1990s, VicRoads has allocated an increasing range of functions to its road construction contractors. The packaging of previously separate elements of works into one single contract for major projects and the transition from construct-only contracts to contracts encompassing both design and construct tasks have been key features of this contemporary direction.

5.2 The packaging of contracts is a positive initiative by VicRoads and offers clear potential for lower costs and better quality outcomes in major road construction projects. Nevertheless, the strategy has raised some concern within the industry, particularly the likelihood that a small number of very large companies will dominate road construction and exercise significant control over sub-contracting practices.

5.3 VicRoads faces the challenge of ensuring the expanding use of larger and more encompassing contracts does not adversely impact on the overall viability and level of competition within the industry as a whole. It also needs to provide a leadership role in encouraging industry best practice in the changing contractual environment and bringing about co-operative relationships between large construction companies and medium to small operators. These relationships will be important in order to create opportunities to smaller companies to develop their business skills beyond their existing capabilities.

5.4 In recognition of the benefits to be derived from agreed protocols between parties participating or involved with road construction, VicRoads has entered into a memorandum of understanding with the State's Environment Protection Authority on the relationship and interactions between the 2 bodies in respect of environment issues associated with road infrastructure. There would be merit in VicRoads building on its early initiative through the establishment of formal protocols with all service providing entities and major regulatory agencies with whom it is required to interact in its management of road construction.

5.5 The examination with the assistance of industry specialists of contractual documents utilised by VicRoads for major construction projects indicated that such documents were of an appropriate quality and in line with industry standards. This view was also generally supported by prime contractors engaged by VicRoads in road projects.

5.6 Within the building and construction industry, the standard of design for major projects is considered to be as important in influencing the ultimate quality of works as the standard of actual construction. VicRoads should be commended for the high quality of its design standards which have received external recognition. With the increasing devolution of responsibility for design functions to contractors under design and construct contracts, VicRoads will need to have available continuing levels of skills and expertise in order to maintain its lead role in the setting and monitoring of design standards.

OVERVIEW - *continued*

5.7 To date, contracts utilised by VicRoads have been predominantly input-based in that they specify requirements in terms of designs, the layout of road and bridge formations and a comprehensive set of technical specifications, all aimed at ensuring adequate road and bridge quality. Output-based considerations such as road smoothness, skid resistance and driver safety under a variety of weather conditions have not been stipulated as performance criteria within contracts. Criteria of this nature would be integral to assessing the quality of a newly-constructed road.

5.8 In a positive initiative, VicRoads is planning to carry out research into the benefits and risks associated with implementation of output-based performance criteria for road construction projects.

FEATURES OF THE ROAD CONSTRUCTION CONTRACTING REGIME

5.9 As explained in Part 2 of this Report, all major road projects are constructed by private sector companies under contract to VicRoads. Given this reliance on contractors, the soundness of contract documentation is of crucial importance to VicRoads in its endeavours to achieve high quality road construction within the State.

5.10 Contract specifications (incorporating detailed plans and defined standards) associated with major works are developed by VicRoads in advance of the tendering process so that all prospective tenderers are aware of, and can address the specific requirements of, the works in their tender submissions.

5.11 Also, since the early 1990s, VicRoads has progressively introduced some significant changes to its contracting regime for major projects including:

- greater integration of a variety of separate road construction works into larger and more encompassing contracts (referred to in VicRoads as *all in contract packaging*) with the aim of undertaking projects using fewer prime contractors thereby reducing the risks to VicRoads inherent in inter-contract interfaces; and
- movement away from *construct-only* contracts, where the contractor is required to construct the specific works in accordance with designs and specifications prepared by VicRoads, to widespread adoption of *design and construct* contracts under which the contractor assumes responsibility for both the design and construction of defined works.

5.12 While there can be some risks in the application of a design and construct approach to highly sophisticated information technology projects, its use in road system developments can give rise to significant timing advantages by minimising the length of time between the design phase and the commencement of construction works. In addition, there is the added benefit to VicRoads of transferring responsibility and the associated risks for design inadequacies and errors to the contractor.

5.13 The progressive allocation of a wider range of tasks to road construction contractors places greater emphasis on the need for effective contract management processes within VicRoads.

TREND TOWARDS ALL-IN CONTRACT PACKAGING

5.14 Prior to the introduction by VicRoads of all in contract packaging, major road projects generally comprised the awarding of a number of separate contracts to several individual contractors for the various construction works.

5.15 The initiative to integrate a variety of separate road construction works into single and more encompassing contracts has progressed to a stage where single contract packages for major projects now cover a large proportion of the works to be undertaken incorporating:

- design and construction of road and bridge works;
- railway and tramway works arising from road construction;
- extensive relocations of water supply, sewerage, drainage, power, telecommunications and gas services; and
- management of environmental considerations and community consultation during construction.

5.16 Recent examples within the Melbourne metropolitan area of such single contracts include the Boronia Rail Crossing and the Exhibition Street Extension Projects.

5.17 With the assistance of specialists, the audit team examined 13 single contracts, with an aggregate value in excess of \$250 million, entered into by VicRoads. To varying degrees, each of these contracts contained characteristics of all in contract packaging. The examination included an evaluation of the extent to which this contracting approach has led to improved management of contracts by VicRoads. As part of this process, discussions on the merits of contract packaging were held with industry representatives.

5.18 It is considered that integration by VicRoads of a range of road construction activities into single contracts has:

- created further opportunities for innovation such as:
 - enhancements in pavement design;
 - improvements in the quality and effectiveness of retaining walls and noise abatement barriers; and
 - enhanced management of contaminated materials and sites; and
- facilitated the accelerated development of industry skills and capabilities in that, through high value single contracts, larger contractors have a greater capacity to invest in areas such as staff training and development, quality assurance systems and occupational health and safety.

5.19 The transition by VicRoads from multiple contracts towards greater use of all in contract packaging constitutes a positive initiative with clear potential for the achievement of cost efficiencies and improved quality of road construction.

5.20 A number of instances were identified during the audit where opportunities for contract packaging had not been pursued by VicRoads and consequently the potential benefits had not been realised. Details of one example are shown below:

THOMASTOWN SECTION OF THE WESTERN RING ROAD

This element of the Western Ring Road project was divided into 3 separate contracts of \$35.6 million, \$24 million and \$5.4 million which were awarded by VicRoads to 3 individual prime contractors in August 1997, October 1997 and March 1997, respectively. VicRoads advised that its decision to utilise 3 separate contracts was based on the need for commencement of construction on one part of the project prior to another part and on the constraints of available funding.

Industry specialists engaged on the audit considered that there was no overriding reason why the entire project could not have been let as one package. Their view was that the total size of the project was well within the capacity of either of the contractors appointed for the 2 larger contracts.

The specialists also considered that the packaging of the 3 contracts into one could have reduced the total project costs by rationalisation of the use of plant and equipment and lower contract management and administrative costs for both VicRoads and the contractor.

5.21 VicRoads should establish suitable policies and practices to ensure that opportunities for contract packaging are pursued in all cases where potential cost efficiencies are available without any adverse impact on the quality of road construction.

5.22 It will also be important for VicRoads to carefully monitor and measure the actual impact on projects of this initiative in such areas as cost levels, timeliness of works and the overall quality of construction. In other words, the benefits of this contemporary approach should be clearly visible in the management analyses undertaken by VicRoads.

Some perceived implications for VicRoads and the industry

5.23 While, as indicated above, the all in packaging of contracts by VicRoads into larger integrated contracts has the potential to achieve operational and administrative efficiencies, a number of concerns were expressed during the audit by some industry participants in regard to this trend including:

- the capacity of VicRoads to professionally monitor and manage major single contracts in the event of any future loss of experienced in-house resources; and
- a fear that the use of large single contracts will restrict competition and lead to a position where only 5 or 6 very large construction companies dominate (as prime contractors) road construction work and control the sub-contracting of this work to other industry operators.

5.24 Conversely, there exists a view, primarily among the larger contractors, that the narrowing of industry participation to a smaller number of major construction companies should lead to enhanced quality of road construction. Such companies were viewed as having a greater capacity to invest in important areas such as quality assurance systems, occupational health and safety practices, and broadening of workforce skills.

5.25 Irrespective of the merit of the above contrasting viewpoints presented by industry participants, VicRoads faces the challenge of ensuring that the expanding use of larger and more encompassing contracts does not adversely impact on the overall viability and level of competition within the industry as a whole. This challenge will require periodic evaluation of selection practices (the current selection processes are addressed in detail within Part 6 of this Report) to provide ongoing assurance as to its capacity to select contractors with the necessary competence in the changed environment.

5.26 The changing environment within the industry arising from the all in contract packaging strategy will also need to be addressed by prime contractors in their interrelationships with sub-contractors. In particular, larger contracts feature a greater proportion of work to be carried out on a sub-contract basis. Consequently, industry sub-contracting practices will require strengthening in several areas including the integrity of payment practices, the soundness of tendering and documentation, quality assurance, occupational health and safety and dispute resolution processes in order to facilitate effective integration of such practices into larger contracts.

5.27 With the trend towards larger and all-encompassing contracts, there is a need for VicRoads, as the lead government road construction agency, to ensure that strategies are in place which encourage:

- the industry to continue to apply best practice to road construction and develop enhanced capabilities in the changing contracting environment for road construction; and
- major road construction companies to develop and implement structured and systematic processes which:
 - enable co-operative partnerships to be established with medium to small companies; and
 - provide opportunities for smaller companies to develop their business strategies and skills beyond existing capabilities.

5.28 Finally, the forming of co-operative relationships between all parties within the industry, including VicRoads, is likely to assume greater significance if a small number of very large construction companies are placed in a dominant position and are, as a result, able to exercise an increasing level of influence over smaller industry participants.

Importance of effective interaction with utility service providers and other agencies in road construction contracts

5.29 As mentioned in an earlier paragraph, the integration into single contracts under all in contract packaging of all road construction works associated with a major project can encompass works relating to the relocation of water supply, sewerage, drainage, power, telecommunications and gas services.

5.30 The consolidation of these service relocations into all in contracts has served to accentuate the importance of effective interaction between all relevant parties, namely, VicRoads, prime contractors, sub-contractors and the various service utilities. Effective co-ordination between these parties is necessary in order to maximise the benefits of this aspect of packaged contracts. While the parties may face additional time pressures, the better co-ordination that occurs in addressing relocation issues can lead to the achievement of significant financial benefits.

5.31 The following examples illustrate the magnitude of the financial benefit that can result from adoption of the above approach:

- In one contract relating to the South Eastern Arterial interchanges, the tender process involving service relocation costs for water supply resulted in a reduction of \$7.4 million from the water utility's estimated cost of \$12.4 million to undertake the works to the approved bid of \$5 million from the successful project contractor; and
- In another contract involving the Exhibition Street Extension Project, the particular electricity distributor provided an indicative price of \$500 000 if it was required to relocate the cables but, following consultation with VicRoads, agreed to pursue alternative strategies during the detailed design stage. A suitable solution was subsequently identified by the contractor at a cost of \$17 300 which resulted in a saving to the project of \$482 700.



Road construction activities at the Exhibition Street Extension Project.

5.32 Conversely, the disadvantage of not resolving service relocation issues at an early stage is illustrated by a contract in which the relevant telecommunications carrier would not allow its services to be interrupted because it required access to its existing cable pits at all times. As the proposed road construction works by the contractor would have prevented such access and the carrier was only prepared to discuss engineering solutions following the awarding of the contract, final resolution of this matter by VicRoads could only be achieved later in the form of a contract variation negotiated between VicRoads and the contractor. The resultant additional cost was reflected as part of an aggregated claim submitted by the contractor at the conclusion of works which was settled with VicRoads for a total of \$492 400.

5.33 In recognition of the potential benefits to be derived from agreed protocols between parties involved in road construction, VicRoads, in a valuable move, has entered into a memorandum of understanding with the State's Environment Protection Authority on the relationship and interactions between the 2 bodies in respect of environmental issues associated with road infrastructure. The purpose of this agreement which became effective from 1 July 1998 is to "*facilitate continued improvement in environmental outcomes from the maintenance, development and operation of Victoria's declared road system through ongoing, cooperative arrangements between VicRoads and the EPA.*"

5.34 Given the importance in major road construction projects of effective co-ordination between many different parties, there would be merit in VicRoads expanding on its early initiative through the establishment of formal protocols with all service providing entities and major State regulatory agencies with which it is required to interact in its management of road construction.

CONTRACT DOCUMENTATION

5.35 Contract documentation for a road construction project will normally include a range of documents which, when considered together, define all rights and obligations of parties in connection with the scope of works to be undertaken within a contract. In particular, documentation will generally incorporate:

- general conditions forming part of the contract;
- project designs and specifications incorporating performance requirements;
- technical drawings associated with the works; and
- a formal instrument of agreement (which normally refers to all of the above documentation).

5.36 The audit examination involved an evaluation of the major forms of contract documents used by VicRoads to determine their overall adequacy and particularly the extent to which they incorporate the following characteristics:

- clear and complete delineation of the rights and obligations of the contracting parties;
- provisions which adequately define the nature of the proposed works and method of delivery of services;
- an appropriate allocation of risk between VicRoads and the contractor; and

- use of terminology which has a consistent application throughout the road construction industry with any departures clearly identified.

Standard of contract documentation

5.37 As mentioned previously in this Part of the Report, VicRoads uses 2 main types of contract, namely, construct-only contracts, and design and construct contracts.

5.38 Overall, the examination which was undertaken with the assistance of industry specialists engaged on the audit indicated that the contract documents used by VicRoads for major road construction projects were of an appropriate quality and in line with industry standards. This conclusion was also generally supported by prime contractors engaged by VicRoads in road projects.

5.39 Notwithstanding the above findings, it is likely that, in the near future, VicRoads may award single contracts for the design and construction of entire projects with values well in excess of \$100 million. It will therefore be advisable for VicRoads to re-evaluate the suitability and adequacy of its contract terms and provision for risk allocation in the light of these larger and broader contracts.

Quality of designs

5.40 Within the building and construction industry, the standard of design for major projects is considered to be as important in determining the ultimate quality of works as the standard of actual construction. Given this significance, design documentation for major road construction projects within the responsibility of VicRoads should be prepared on the basis of standards and procedures which ensure safe, reliable and functional roads. For such projects, it would be expected that:

- standards of design are viewed as leading edge within the industry; and
- externally accredited quality assurance systems for design are in place.

5.41 An evaluation during the audit of design documentation associated with major road projects indicated that the standards of design achieved by VicRoads are of a high standard. In this regard, it was identified that:

- For particular designs, VicRoads has received several Excellence Awards, for example from the Institution of Engineers Australia and the Australian Institute of Steel Construction;
- VicRoads was awarded an Asian Development Bank contract for a review of highway design standards in China in late 1996. This project was won against bidders from Hong Kong, Japan, Switzerland and USA among others, and has been highly commended by Chinese officials; and
- VicRoads has implemented an externally accredited quality assurance system relating to design for the past 3 years and has satisfied accreditation requirements for the systematic review of compliance with this system.

5.42 VicRoads should be commended for the high quality of its design standards. With the increasing devolution of responsibility for design to external contractors under design and construct contracts, it will be important for VicRoads to ensure that it has access to adequate levels of skills and experience in order to:

- continue its lead role in the setting and monitoring of design standards; and
- maintain or even improve its current high quality of such standards.

Potential to adopt output and performance-based contracts

5.43 In addition to the introduction of new approaches to road construction contracts and maintaining a high standard of contract documentation, VicRoads aims to achieve clear specification of the performance requirements for construction works under contracts. It strives to support this approach with a robust quality assurance framework, in order to best meet its responsibilities as the State's principal road construction authority.

5.44 VicRoads has assigned increasing responsibility to contractors under initiatives such as the progressive use of design and construct contracts. However, its contracts are predominantly input-based in that they specify requirements in terms of designs, the layout of road and bridge formations and a comprehensive set of technical specifications, all aimed at ensuring adequate road and bridge quality. Output-based provisions such as road smoothness, skid resistance and driver safety under all weather conditions are not stipulated as performance criteria within existing contracts. It is considered that criteria of this nature would be integral to assessing the quality of a newly-constructed road.

5.45 The advantage of inclusion of such criteria within contracts is that there will be greater encouragement for prospective contractors to submit innovative and creative approaches for achieving quality road outcomes. Also, the use of output-based performance criteria would more readily provide an opportunity for the introduction of incentive provisions under which contractors could be rewarded for exceeding criteria linked directly to quality as well as to cost and timeliness of construction.

5.46 There is an increasing recognition of the desirability of moving to output specifications for performance requirements in other States such as New South Wales and Western Australia and in some overseas countries including New Zealand and the United States of America.

5.47 In discussions during the course of the audit, VicRoads advised that it is planning to initiate relevant research projects to investigate the potential benefits and risks associated with the implementation of an output-based approach to its road construction contracts. Audit supports this proposed research action.

ESTABLISHING THE COSTS OF CONSTRUCTION PROJECTS

5.48 In undertaking the audit examination, it was considered important to confirm that VicRoads had in place sound procedures for estimating costs at all major stages of a project's life cycle, from initial feasibility studies through to the final post-construction stage.

5.49 Within VicRoads, the process of estimating project costs comprises 3 elements, namely:

- development of *preliminary cost estimates* during the initial planning phase to support funding submissions to government for potential projects;
- compilation of *estimated costs by the relevant project manager*, generally upon assuming responsibility for the management of a project; and
- preparation of an *initiating report* which is used for the seeking of approval for commencement of works and incorporates *tender (or engineer's) estimates* for individual contracts.

PRELIMINARY COST ESTIMATES

5.50 Preliminary cost estimates typically present an early assessment of overall project costs dissected according to major elements of the project. The estimates are preliminary in nature and could be expected to change significantly during subsequent design and development phases of the project.

5.51 VicRoads advised during the course of the audit that, based on experience, final aggregate project costs can be approximately 20 to 40 per cent higher or lower than the pre-contract project cost estimates. An example of a significant variation in costs experienced in a particular contract is presented below:

THOMASTOWN SECTION OF THE WESTERN RING ROAD (MAHONEY'S ROAD TO DALTON ROAD)

The preliminary cost estimates prepared in December 1995 indicated an estimated cost of \$130 million for these works.

Government funding was subsequently obtained for a total estimated cost of \$140 million comprising Australian Government funding of \$80 million and State Government funding of \$60 million. The additional allocation of \$10 million represented an allowance for land acquisition.

The revised total estimated cost of the project at the time of audit was \$99 million having been reduced from the initial funding approval of \$140 million.

VicRoads attributed the variance of between \$30 and \$40 million, around 30 per cent, between the preliminary cost estimates and the likely final cost, to contractor innovation achieved through the design and construct process as well as market competition between tenderers. Specialists assisting during the audit considered that a variation of this magnitude would also raise questions regarding the accuracy of the preliminary estimates.

5.52 Important items such as project management costs (including administration costs associated with community interaction) expected to be incurred by VicRoads and contingency allowances to cater for subsequent changes in project scope are not separately identified within calculations of preliminary cost estimates. If the assessed initial costs of such items were recorded as part of the preliminary estimates, the Government would be better placed to evaluate both the initial funding commitment sought by VicRoads and any subsequent submissions for cost variations during the course of the project.

5.53 Separate disclosure of project management costs would also enable VicRoads to benchmark the extent of its outlays associated with project management against industry best practice. On this point, project management costs incurred by VicRoads can comprise up to 9 per cent of total costs on construction projects. Specialist advice provided during the audit indicated that project management costs of up to 5 per cent for large projects were normally incurred within the construction industry depending on the complexity of the project.

5.54 While it is recognised that the road construction environment of VicRoads may not be totally comparable with the building construction industry, VicRoads should, nevertheless, evaluate the magnitude of its overall project management costs with a view to identifying any opportunities for improving efficiency in this area.

COST ESTIMATION BY PROJECT MANAGERS

5.55 It is the practice of VicRoads to appoint an internal project manager for each major project either prior to or after an application for funding of the project has been made to the Government. Following this appointment, a project manager would normally compile a cost estimate for the project. However, there are no formal procedures in place for the calculation of such an estimate and project managers do not reconcile their own costs with the previously described preliminary cost estimates in the compilation of the costs. The estimates are not generally retained as formal project documentation but are kept by the project managers as part of their personal files.

5.56 Estimates prepared by project managers are sufficiently important to the overall cost estimation process that they should be capable of reconciliation with preliminary cost estimates and be recorded as part of formal project documentation. In addition, a uniform methodology should be used to facilitate consistency in the preparation and content of these projections.

INITIATING REPORTS AND TENDER ESTIMATES

5.57 The tender estimates, compiled by engineers at VicRoads and forming part of initiating reports, incorporate:

- the anticipated contract value;
- an allowance for price adjustments based on expected cost escalation and contract variations;
- estimates of project management costs to be incurred by VicRoads; and
- provision for contingency allowances.

5.58 These tender estimates form an important part of the process leading to the granting of approval to proceed with tendering procedures for individual contracts. The estimates are also used to confirm the initial budgetary allocation for contracts. Notwithstanding their overall significance, initiating reports are generally approved at the project manager level. It is considered that such reports encompassing tender estimates should be presented to senior management for approval to ensure that the calling of tenders can proceed within budgetary allocations.

Initiating reports not prepared for all projects

5.59 Despite the importance of initiating reports to the project approval process, instances were identified where reports for particular contracts had not been prepared on a timely basis.

5.60 By way of illustration, in a contract valued at \$36 million associated with the Western Ring Road project (Mahoneys Rd to Edgars Rd), the initiating report had not been prepared until after potential contractors had been shortlisted to submit tenders. In another major contract, relating to the Thomastown Section of the Western Ring Road with a value of \$23.9 million, the examination identified that an initiating report had not been compiled.

5.61 According to project staff at VicRoads involved with both the above contracts, pressures to ensure the timely commencement of works were cited as the major reasons for the problems experienced with initiating reports.

5.62 In cases where delays occur in the preparation of initiating reports, the capacity of VicRoads to adequately scrutinise all relevant details of project proposals prior to approval can be significantly weakened. VicRoads should ensure that initiating reports are available for consideration before approval is given for commencement of the tendering process.

Scope to achieve greater accuracy in tender estimates

5.63 In addition to forming an important part of the process for the granting of approval to proceed with contracts, tender estimates are made available to tender evaluation teams to assist in their assessment of tender bids. A final version of the tender estimate is placed in the tender box and examined by the evaluation team with the tenders.

5.64 Representatives of VicRoads advised that tender estimates as a general rule should equate with the median value of all tenders if they are to be a useful benchmark for an evaluation team to utilise in the assessment of contractor bids. Alignment of estimates with the median value would, according to VicRoads, adequately account for very high tender bids such as those submitted by tenderers who may not be seriously interested in winning the tender and excessively low bids from tenderers who may have significantly understated the requirements and cost of the construction works.

5.65 A comparison of tender estimates with tender bids relating to a selection of 35 major contracts found that in 23 cases, estimates were higher than the median value of bids. This comparison also identified that:

- over 70 per cent of estimates were greater than the **final contract amount** after completion of specified works (which would reflect all cost variations ultimately agreed to between the parties); and
- around 50 per cent of estimates were higher than **all** bids received.

5.66 Only about 25 per cent of tender estimates could be reasonably compared with the lowest bid (within 10 per cent or less from the lowest bid) and no estimates were below the lowest bid.

5.67 Staff within VicRoads responsible for the preparation of tender estimates advised that it was not always possible to compile reliable estimates at the concept or early design stage of a project when the majority of available information is very much preliminary in nature. On this point, specialists engaged during the audit commented that it is common industry practice to prepare estimates of this nature as part of the development of major infrastructure, mining and resources projects, which can involve substantial road and bridge works.

5.68 As previously mentioned, a specific function of tender estimates recorded within initiating reports is that they are used within VicRoads to confirm the initial budgetary allocation for contracts. Any over-estimation in this area can therefore lead to:

- less than optimum decisions by VicRoads in earmarking scarce financial resources across road construction contracts; and
- from a wider viewpoint, the diversion of funding from other high priority areas of government.

5.69 A further serious potential consequence of inadequacies in the compilation of tender estimates is that tender evaluation teams will not have accurate and reliable information available to assist in their judgement of the most appropriate tender bid.

5.70 These circumstances could give rise to the awarding of tenders where bids have excessively understated the cost of required works which may in turn create financial pressures for the contractor and ultimately impact on the quality and timeliness of the construction project.

5.71 Clearly, tender estimates need to constitute an accurate and useful basis for assisting tender evaluation teams in the assessment of tenders and for confirming initial budgetary allocations to contracts. In the circumstances, it was regarded as important that VicRoads re-assessed the adequacy of its procedures in place for the development of tender estimates.

5.72 To its credit, VicRoads initiated action late in 1998 to improve cost estimation practices. In this regard it issued new guidelines *Project Management Guidelines: Scope and Cost Control* which provide broad guidance to its staff. Specialists engaged during the audit viewed this move as positive, however, they considered VicRoads needed to continue to improve the overall adequacy of its expertise in cost estimating for major projects. The specialists believed the issue of the new guidelines should not be regarded as a total substitute for the continuous strengthening of the organisation's capability in this important field.

❑ **RESPONSE** provided by the Chief Executive of VicRoads

Features of the Road Construction Contracting Regime

Since 1993, VicRoads has awarded 35 major “design and construct” contracts out of a total of 525 road construction contracts. The design and construct contracts are used where there is scope for innovation to achieve the most cost effective outcome, consistent with the specified performance requirements. The use of this form of contract has been very successful in this regard.

Trend Toward all in Contract Packaging

The packaging of contracts for the delivery of major projects is determined on a case-by-case basis taking into account:

- availability of funding over the duration of the project;
- the need to minimise disruption to traffic and the community;
- avoidance of interfaces between contracts that might constrain a contractor’s operations and give rise to claims;
- the potential to achieve economies of scale;
- risk exposure.

The three contracts on the Thomastown section of the Ring Road referred to in paragraph 5.20 could have been consolidated into a single contract if the necessary stream of funding was available. This was not the case. However, there is no evidence that a combined contract would have been more cost effective. The three separate contract components were bid very competitively resulting in a final cost well below the project estimate and project delivery well ahead of schedule.

The audit refers to concerns raised by some contractors regarding the use of larger contract packages. The distribution of the size and value of contracts of awarded in the period from July 1997 to November 1999 was:

Value	Number of contracts
\$0m to \$2m	120
\$2m to \$5m	8
\$5m to \$10m	5
\$10m to \$20m	2
Above \$20m	7

VicRoads has established a strong relationship with the civil contracting industry through regular dialogue with representatives of the industry’s peak associations, the Civil Contractors Federation and the Australian Constructors Association. A quarterly meeting provides a forum for discussion on improvements to specifications and contract requirements, and contract management policies and procedures.

In the past year this regular forum has assisted VicRoads in a major revision of design and construct specifications and a current review of the prequalification scheme which will introduce a regular performance feedback process to foster and reinforce continuous improvement in management systems and capabilities.

❑ **RESPONSE** provided by the Chief Executive of VicRoads - continued

Effective interaction with other agencies

Paragraph 5.33 refers to a Memorandum of Understanding between VicRoads and the Environment Protection Authority. The memorandum is not specifically about road construction. It covers all aspects of the relationship between the agencies in planning, constructing and operating the road system.

The nature of VicRoads relationship with other agencies differs from the EPA, particularly in the case of the privatised/corporatised utility authorities. VicRoads is currently developing an approach that will formalise relationships with these authorities for particular utility installations. Discussions have been held with other States about the opportunities for a commonality of approach.

Paragraph 5.32 refers to a claim for costs associated with service alterations. The figure of \$492,400 cited by the audit was not a settlement figure. It was an internal assessment figure of VicRoads potential exposure should the claim be determined by arbitration. The figure was used in arriving at a commercial settlement to a global claim submitted by the contractor.

Contract Documentation

VicRoads standard specifications for major contracts are as far as practicable performance based ie. they specify what is required, rather than how it should be constructed.

The only significant element which has not been specified fully in terms of performance requirements is the road pavement and road surfacing. This is a direction that is currently being piloted on a number of contracts by VicRoads and represents a leading edge approach to performance specification. However it is important that this approach be developed carefully, and in a way that enables the industry to adapt to a very different set of responsibilities and risk allocation.

Establishing the Costs of Construction Projects

VicRoads current estimating practice is set out in formal guidelines for 'Project Scope and Cost Control' which were published and implemented in October 1998 to address a number of the issues identified in the audit report. These guidelines were made available to the audit but would not appear to have been taken into account in relation to the following aspects:

- *Project estimates are prepared with the aim of delivering seventy-five percent of projects within the project budget. (ie. twenty-five percent may exceed the budget in order to achieve delivery of the overall Program on budget.);*
- *The guidelines prescribe formal estimating procedures and a uniform methodology, including consistent definition of the key elements such as project management costs and transparent contingency allowances; and*

❑ **RESPONSE** provided by the Chief Executive of VicRoads - continued

Establishing the Costs of Construction Projects - continued

- *Procedures for project scope and cost control require executive approval to projects estimated to cost more than \$3 million, through VicRoads Planning and Design Review Committee. This process reviews the project design standards and specific performance requirements, and the contract packaging strategy.*

Paragraph 5.53 cites specialist advice regarding project management costs within the construction industry. Major road projects involve complex external interfaces and extensive community consultation. Any comparison between project management costs for these projects and other types of civil engineering or building projects would need to take into consideration the relative breadth of project management responsibilities and functions.

Part 6

Selection of contractors

OVERVIEW

6.1 The selection of contractors represents a crucial phase of the overall management framework established by a public sector entity in circumstances where significant levels of government activity are outsourced to the private sector.

6.2 To its credit, VicRoads has over the years directed high priority to ensuring that contractors selected to undertake road construction works are capable of meeting their obligations in delivering quality outcomes within established cost and time parameters.

6.3 In pursuing this aim, it has developed a 3-staged approach to the engagement of contractors incorporating, as a specific feature, a scheme for the pre-qualification of contractors. This scheme establishes the foundation for subsequent preregistration of those contractors who have expressed interest in specific projects. A formal tender process is then followed to appoint the successful contractor.

6.4 Overall, the pre-qualification scheme for contractors was found to be a comprehensive and well managed process for the identification and appointment of potential contractors for construction projects. A number of opportunities were identified for VicRoads to further enhance the scheme particularly through:

- greater scrutiny of the ongoing financial viability of prequalified contractors; and
- strengthening of decision-making processes by the inclusion of an external representative on the committee assigned responsibility for the operation of the scheme.

6.5 A number of municipal councils operate their own pre-qualification schemes and the Department of Infrastructure is currently considering the setting up of a pre-qualification database which could apply to contractors engaged by it in infrastructure works.

6.6 There would be merit in the Government assessing the feasibility of implementing a common pre-qualification scheme for road construction contractors engaged at both State and local government levels. With the significant involvement of the Australian Government in funding construction of national highways and roads of national importance, the value of adoption of a national approach to pre-qualification of contractors could also be assessed.

6.7 The establishment of a uniform approach within government to contractor pre-qualification would, through the use of common standards, lead to better quality outcomes in construction works and lower administrative costs to both government and contractors.

OVERVIEW - continued

6.8 VicRoads proposes to complement the preregistration of contractors for specific contract works with a greater focus on the shortlisting of contractors in order to identify a smaller and more manageable number of contractors to be invited to submit detailed tenders. It is yet to determine how the proposed shortlisting of tenderers will actually be managed for large projects as agreement on changed procedures had not, at the time of the audit examination, been reached with the industry.

6.9 VicRoads has established comprehensive tendering procedures covering all aspects of this final key phase of the selection process. Examination of these procedures revealed that:

- tender documentation prepared by Vic Roads was generally of a high standard;
- strong control was exercised over the opening and processing of submitted tenders with a particular emphasis on security and control over access to tender documents;
- tender evaluation teams followed a structured approach in the evaluation task and a sound documentary trail was in place to substantiate recommendations for appointment of preferred tenderers; and
- communications with tenderers leading to the selection decision were well conducted, transparent and adequately recorded.

6.10 There are opportunities in some areas for VicRoads to achieve further improvement in the management of its tendering processes mainly through the selective use of an external probity auditor to provide independent confirmation of the fairness and equity of its procedures and by widening the membership of tender evaluation teams to encompass external individuals of suitable standing and expertise.

STAGES IN THE APPOINTMENT OF CONTRACTORS

6.11 As referred to in previous Parts of this Report, VicRoads outsources work associated with major construction projects to the private sector. This focus on outsourcing has been accompanied by a greater emphasis by VicRoads in recent years directed to the use of design and construct contracts for the majority of major construction works.

6.12 VicRoads generally engages a prime contractor who assumes many of the risks associated with the project and is responsible for the day-to-day management of the construction process. In fulfilling this role, the prime contractor usually appoints a wide range of sub-contractors to undertake various aspects of construction and associated works. Although prime contractors are required to obtain the approval of VicRoads prior to their appointment of sub-contractors, VicRoads has little direct involvement in the actual appointment processes followed by prime contractors.

6.13 The selection of prime contractors by VicRoads involves the following 3 key stages:

- a pre-qualification scheme which, according to guidelines issued by VicRoads, aims to “ensure that only contractors which have demonstrated the required capability in respect to quality management, occupational health and safety and environmental management are engaged by VicRoads and that the technical capability and financial capacity of these contractors is commensurate with the works tendered for”;
- the preregistration of prequalified prime contractors for specific projects under which VicRoads seeks registrations of interest from prequalified contractors and shortlists those parties to be invited to submit tenders; and
- evaluation of submitted tenders and selection of the prime contractor to undertake the road construction works.

6.14 With significant reliance placed on prime contractors, it is clearly important that sound management processes are in place within VicRoads to ensure that all selected contractors are capable of meeting their obligations in delivering quality outcomes for projects within established cost and time parameters.

PRE-QUALIFICATION SCHEME

6.15 VicRoads introduced its pre-qualification scheme for prime contractors in 1989.

6.16 In addition to an initial requirement to ensure the financial capacity of applicants for pre-qualification, other criteria utilised in this process include:

- *“standard of work;*
- *quality assurance over contract performance;*
- *managerial performance (including management and supervision of sub-contractors and effective site and industrial relations);*
- *occupational health and safety performance and compliance with OH&S obligations;*
- *environmental management performance and compliance with statutory requirements;*
- *payment of sub-contractors and suppliers; and*
- *compliance with the Victorian Code of Practice for the building and construction industry.”*

6.17 Prequalified parties are required to seek renewal of their status every 2 years.

6.18 As at 30 June 1999, 46 contractors have been approved by VicRoads under the pre-qualification scheme. Approved contractors may nominate to be prequalified under one of the scheme’s 4 pre-qualification levels beginning with the lowest level relating to a capability to undertake works to a value of \$2 million. Table 6A presents the 4 levels and the number of approved contractors at each level at 30 June 1999.

**TABLE 6A
PRE-QUALIFICATION LEVELS AND NUMBER OF APPROVED
CONTRACTORS
AS AT 30 JUNE 1999**

<i>Levels for roadworks</i>		<i>Levels for bridgeworks</i>	
<i>Contractor capable of works to the value of:</i>	<i>Number of approved contractors</i>	<i>Contractor capable of works to the value of:</i>	<i>Number of approved contractors</i>
\$2 million	All 46	\$1 million	All 33
\$5 million	27 of the 46	\$3 million	25 of the 33
\$10 million	20 of the 46	\$6 million (and above)	14 of the 33
\$20 million (and above)	11 of the 46		

Source: Contractor Registration and Pre-qualification Scheme - guidelines and conditions prepared by VicRoads.

6.19 Prequalified contractors at a particular level may apply for advancement to a higher level if they are able to satisfy the more stringent requirements associated with progression.

6.20 Tender advertisements placed by VicRoads specify the minimum pre-qualification level applicable to the particular tender and only contractors prequalified at that level or higher are eligible to tender. Where a pre-qualification level is not stipulated, tenders from contractors who are yet to be approved under the scheme will only be considered by VicRoads in exceptional circumstances.

6.21 VicRoads views its pre-qualification scheme as a key tool for enhancing the efficiency of the tender evaluation process and providing a level of assurance that contractors possess the necessary skills and experience to reliably undertake the construction of roads and bridges within the State.

Overall soundness of the pre-qualification scheme for contractors

6.22 The audit evaluation of the pre-qualification scheme encompassed:

- discussions with relevant personnel within VicRoads and with contractors in the building and construction industry; and
- an examination of:
 - policies and guidelines covering the operation of the scheme;
 - the process followed for the assessment of applications submitted by contractors for pre-qualification; and
 - the pre-qualification database which records relevant details of approved contractors.

6.23 The overall conclusion reached by audit was that the pre-qualification scheme for contractors is operating effectively in meeting its aim of ensuring that only contractors with the requisite capabilities are engaged by VicRoads to undertake construction work. In particular, audit found that:

- the guidelines and conditions developed for the scheme were well structured and had been subject to periodic review and enhancement;
- an emphasis is placed on providing assistance, for example through the availability of training in key areas, to parties interested in achieving pre-qualification; and
- use is made of external specialists in the assessment of particular elements of an applicant's profile, for example, purported expertise in occupational health and safety.

6.24 In addition, in terms of the principles of fairness and equity, the scheme incorporates an appeals process for any applicants who may feel aggrieved by decisions reached under the scheme. No appeals have been lodged over the period 1 July 1997 to 30 June 1999.

Opportunities for further enhancements to the pre-qualification scheme

6.25 While the scheme was found to be operating effectively, some further enhancements could be made by VicRoads.

Need for greater scrutiny of ongoing financial viability of contractors.

6.26 Until 1996, applicants for renewal of pre-qualification were required to submit financial statements for the previous 2 years. VicRoads discontinued this practice on the grounds that it was not seen as adding value to the pre-qualification process. As such, there is now no requirement for contractors to provide information on their financial status during their term of pre-qualification. Financial information is generally only requested in cases where concerns arise over the financial viability of specific contractors.

6.27 Given the financial volatility of the building and construction industry, the financial position and viability of individual contractors can vary significantly over a short period of time. Accordingly, the absence of regular monitoring by VicRoads of the financial position of contractors may result in the awarding of contracts to contractors, who, although prequalified, could in fact be suffering financial difficulties. While this issue has not been a serious problem for VicRoads in the past, the situation does have the potential to place major projects at risk.

6.28 In order to minimise risks arising from the financial viability of contractors, VicRoads should:

- require prequalified contractors to furnish audited financial statements at least every 2 years and preferably to coincide with the lodgement of their renewal application; and
- engage suitably qualified experts to evaluate the financial information submitted by contractors.

6.29 The importance of thorough monitoring of the financial viability of prequalified contractors is reinforced by the fact that no further examination of the financial circumstances of these contractors occurs during the tender evaluation stage.

Scope for external representation on the Contractor Registration and Pre-qualification Committee

6.30 VicRoads utilises an internal Contractor Registration and Pre-qualification Committee to evaluate applications for pre-qualification and to assign a pre-qualification level to applicants. This committee comprises representatives from several organisational divisions who possess a broad range of expertise in the various facets of road construction.

6.31 While membership of the committee is sufficiently wide to be capable of expert evaluation of applications and some use is made of external assistance in specialised areas, consideration could be given from time-to-time to appointing at least one external member from the road construction industry. Such action would complement the internal representation on the committee and bring a broader perspective to the committee's deliberations. It would also reduce any risk that the objectivity of the pre-qualification process could be open to question.

Importance of the pre-qualification database

6.32 VicRoads records all relevant details associated with the pre-qualification scheme in a computerised database. The recorded information includes data relating to contractors approved for pre-qualification as well as particulars compiled over time on contractors' actual performance on road construction projects. This latter information is available, if required, for use by tender evaluation panels.

6.33 Overall, audit found that the database was an up-to-date record of pre-qualification information and adequate security measures were in place to prevent unauthorised access to confidential data.

6.34 The effectiveness of the database as a key management tool could be further improved if information on the performance of prequalified contractors, when engaged as sub-contractors on major construction projects, was also recorded within the database. On this point, the interchangeability of contractors between the roles of prime and sub-contractors is commonplace within the industry. Accordingly, any performance data dealing with contractors, while in their sub-contracting role, would be relevant to VicRoads in terms of decisions reached on the renewal of the pre-qualification status of such contractors.

6.35 A small number of instances were identified where pertinent details relating to a contractor had not been recorded in the database. By way of illustration, details of a company which had performed poorly on a certain contract had not been entered in the database. In another instance, no follow-up had occurred to confirm that a company had supplied specifically requested information concerning occupational, health and safety matters. Introduction of periodic reviews of the database would provide greater assurance on the completeness and accuracy of recorded material.

External views on any future revisions of guidelines

6.36 As mentioned previously, the guidelines developed for the scheme are well structured and subject to periodic review within VicRoads.

6.37 During future revisions of the guidelines, VicRoads should consider seeking the views of a broad cross-section of prequalified contractors to obtain an external perspective on the quality and adequacy of the issued material.

Potential for benefits from a uniform approach within government to contractor pre-qualification

6.38 It is understood that a number of municipal councils operate their own pre-qualification schemes and the Department of Infrastructure is currently considering the setting up of a pre-qualification database which could apply to contractors engaged by it in infrastructure works.

6.39 There would be merit in the Government assessing the feasibility of implementing a common pre-qualification scheme for road construction contractors engaged at both state and local government levels. With the significant involvement of the Australian Government in funding construction of national highways and roads of national importance, the value of adoption of a national approach to pre-qualification of contractors could also be assessed.

6.40 It is probable that the establishment of a uniform approach within government to contractor pre-qualification would, through the use of common standards, lead to better quality outcomes in construction works and lower administrative costs to both government and contractors.

Contractors' views on the pre-qualification scheme

6.41 As indicated in an earlier paragraph, contractors may nominate to be prequalified under one of the scheme's 4 pre-qualification levels. The earlier Table 6A presented details of these levels.

6.42 Discussions during the audit with prequalified contractors revealed that problems have been experienced by medium-sized and small firms in advancing to a higher level due to the extent of the differential in the value of construction works used to establish the various categories of pre-qualification. For example, medium-sized contractors have found it difficult to make the transition from a \$10 million road works limit to the next level of \$20 million. These contractors would prefer a greater number of levels to enable easier progression, for example, through the inclusion of additional pre-qualification thresholds at say \$13 and \$16 million.

6.43 In addition, contractors considered that access to the scheme could be made more attractive to small and medium-sized firms if VicRoads was able to make the scheme administratively less demanding. In this regard, they advised that:

- Currently, the same level of documentation is required from all contractors irrespective of their level of pre-qualification. Contractors were of the view that a simpler set of documentation for the lower levels would assist in minimising administration costs associated with the scheme;

- For those entities who have a long and proven track record, the pre-qualification period could be extended from the current 2 year period to between 3 and 5 years with resultant reductions in time associated with re-applying for pre-qualification status; and
- The costs associated with some recently introduced additional demands such as establishing, operating and maintaining quality assurance systems, occupational health and safety mechanisms, and environmental management plans have made it prohibitive for some entities to continue to remain prequalified.

6.44 All of the issues raised by contractors should at least be considered by VicRoads. However, it needs to be recognised that the smaller firms within the industry are likely to be the more vulnerable in terms of experiencing financial difficulties and in turn in meeting the quality standards set by VicRoads for road construction.

6.45 Also, in terms of the latter issue mentioned above, it would not be appropriate for VicRoads to reduce its pre-qualification requirements in the stated areas in the light of the increasing importance placed by government and the community on health, safety and environmental issues, and on high standards of performance of contractors providing services to government.

PRE-REGISTRATION (SHORTLISTING) OF CONTRACTORS FOR SPECIFIC CONSTRUCTION CONTRACTS

6.46 The next step in the process followed within VicRoads for the selection of a contractor for a particular road construction project has over the years involved a system of preregistration.

6.47 Under its preregistration process, VicRoads seeks registrations of interest in a specific contract from prequalified contractors. Following an evaluation of registrants, a decision is then reached to invite tenders from a selected number of contractors.

Past experience with preregistration of contractors

6.48 Some of the anticipated benefits of the preregistration process, as set out in the Contract Manual issued by VicRoads (the manual was superseded by the Contract Management Quality System in July 1999), are:

- *“a high expectation that contracts awarded to contractors prequalified or preregistered will be completed satisfactorily;*
- *inviting competitive tenders from contractors adjudged to be competent and responsible helps to ensure that realistic tenders are received; and*
- *the opportunity for VicRoads to make a substantive assessment of a contractor’s suitability prior to calling tenders reduces the time required to consider tenders at the tender assessment stage.”*

6.49 The first 2 envisaged benefits mentioned above build on the level of general assurance derived by VicRoads under its pre-qualification scheme in that they arise from consideration of a contractor’s specific capability to satisfactorily undertake the road construction works subject to tender. In discussions during the audit, contractors signified broad satisfaction with these 2 aspects of the preregistration system.

6.50 However, many contractors expressed concern in relation to the third envisaged benefit of the preregistration system. Central to this concern was the fact that, in some cases, contractors who registered their interest in a project were subsequently requested to submit a detailed tender. Some contractors advised audit that the cost of submitting tenders for major projects can be as high as \$250 000. These contractors suggested that VicRoads request detailed tenders from no more than 4 contractors for any one contract.

6.51 This situation was confirmed during the audit from an examination of the operation of the preregistration process over recent years. Instances were cited where as many as 7 firms had been selected to submit detailed tenders. It is considered that this action negates the aim under preregistration of reducing the time absorbed in the evaluation of tenders and the associated cost to both VicRoads and contractors.

Proposed system for shortlisting of tenderers

6.52 Towards the end of the audit, VicRoads advised that it had commenced action to address the above weakness in the preregistration system. In this regard, it proposes a more focused approach to shortlisting of tenderers as soon as agreement on changed procedures is reached with the industry.

6.53 Under the changes envisaged by VicRoads, the system of registration of interests will be retained and a specific shortlisting stage will be used to rank registrants and identify a smaller number of contractors to be invited to submit detailed tenders.

6.54 A major difficulty currently confronting VicRoads is determining a suitable basis for the actual shortlisting of contractors. By way of illustration, there are 11 large construction companies within the industry that VicRoads considers are equally capable of undertaking construction works for major projects (in excess of \$20 million). At the time of the audit examination, VicRoads was uncertain as to how its proposed shortlisting of tenderers will be managed for large projects. It was involved in discussions with the industry with the objective of reaching agreement on a clear and justifiable process for shortlisting contractors.

6.55 Shortlisting criteria available for consideration by VicRoads in addressing this issue include the quality of submitted designs, relevance of any unique strengths of tenderers, the magnitude of current work commitments, assessed financial position and the track record of the proposed project management team.

6.56 It is appropriate to recognise the positive steps taken by VicRoads to refine its approach to shortlisting and have in place a more efficient approach to the identification of contractors to be invited to submit detailed tenders. Also, the move by VicRoads to consult with the industry on the matter is positive.

6.57 Clearly, it is important that this issue is resolved by VicRoads, ideally with industry agreement, without undue delay. The absence of early industry agreement should not be regarded as a significant impediment to VicRoads taking the lead role in formulating criteria for the shortlisting of contractors.

TENDERING PROCESSES FOR MAJOR ROAD CONSTRUCTION PROJECTS

Existence of effective and equitable tendering processes

6.58 The third and final stage of the process in place within VicRoads for the engagement of contractors to undertake road construction works involves the detailed evaluation of tenders.

6.59 A well-structured tendering process would exhibit the following characteristics:

- tender documentation incorporating specifications which:
 - outline the criteria to be used in the evaluation process;
 - provide sufficient information for meaningful tenders to be prepared and submitted by potential contractors; and
 - are made available to all prospective tenderers;
- adequate control and security over the receipt and recording of tenders;
- evaluation processes that ensure fair consideration of all tenders and result in the selection of the most appropriate tender; and
- independent confirmation that probity standards have been met.

6.60 VicRoads has established comprehensive tendering procedures covering all aspects of this key phase of the road construction process. Specific elements of these procedures include:

- the use of 13 different packages containing standard tender documentation, including technical specifications and designs, applicable to particular categories of road construction projects, for example, rural and urban freeways and highways and associated bridgeworks;
- the holding of pre-tender briefing meetings for all potential tenderers (special emphasis is placed on the importance of all prospective tenderers attending these meetings);
- carefully defined requirements covering control and security over the receipt, opening, registering and storing of, and access to, tenders; and
- appointment of an internal evaluation panel for each contract which is responsible for recommending a preferred tenderer.

6.61 Observations during the audit of the tendering processes adopted for a selection of major construction contracts, examination of tender documentation and discussions with both VicRoads and a number of industry representatives revealed that:

- tender documentation prepared by Vic Roads was generally of a high standard;
- strong control was exercised over the opening and processing of submitted tenders with a particular emphasis on security and control over access to tender documents;
- tender evaluation teams followed a structured approach in the evaluation task and a sound documentary trail was in place to substantiate recommendations for appointment of preferred tenderers; and
- communications with tenderers leading to the selection decision were well conducted, transparent and adequately recorded.

6.62 VicRoads should be commended for the action it has taken to ensure that a sound management framework is in place for this key phase of its operations.

Potential for further improvements in tendering processes

6.63 There are opportunities in some areas for VicRoads to achieve further improvement in the management of its tendering processes.

Scope for external participation in tender evaluation teams

6.64 It has been longstanding practice at VicRoads to utilise tender evaluation teams comprising solely of internal personnel. The evaluation function is undertaken by the members of the management group responsible for overseeing all stages of the relevant construction project.

6.65 The use of project management staff in tender evaluation tasks is a logical course of action as such staff possess specific knowledge relating to the project and are therefore best placed to reach the most appropriate selection decision. Nevertheless, there would be merit in VicRoads considering the inclusion from time-to-time on tender evaluation teams of one or more external individuals of suitable standing and expertise. Such action would complement existing internal skills through the introduction of an external perspective to the evaluation function. It would also be viewed by the industry and community as a positive initiative further strengthening the overall integrity of decisions reached by VicRoads on the selection of contractors.

Absence of external probity arrangements

6.66 For some time now, there has been increasing emphasis at government level on the soundness of probity arrangements applying to the management of tenders within public sector agencies. As part of this process, guidance has been issued to agencies on the role of an independent probity auditor in confirming that a fair and equitable tendering and selection process is followed. In fact, the use of an external probity auditor in both public and private sectors is now regarded as an essential feature of the management of major tendering arrangements.

6.67 To date, VicRoads has not utilised an independent probity auditor to support the integrity of its evaluation of tenders and decisions reached on the awarding of contracts. The use by VicRoads of an external probity auditor, at least on selected major projects, would build upon existing practices and provide independent confirmation of the fairness and equity of its tendering processes.

Importance of examination of individual cost elements comprising tender bids

6.68 When reporting the results of the assessment of tenders and putting forward a recommendation for a preferred tenderer, it is important that tender evaluation teams direct sufficient attention, *inter alia*, to the individual cost elements of submitted tenders.

6.69 The advantages of considering the detailed cost break-up of bids are that it assists in the analysis of low price bids and in the investigation of any significant variances between bids and tender estimates earlier prepared by engineers within VicRoads. A strong focus on individual cost elements also facilitates identification of any attempts by tenderers to utilise a practice known in the industry as the *front-end loading* of pricing schedules. This practice involves tenderers aiming to recover an excessive proportion of the contract sum during the early stages of the contract term, often in order to enhance their initial cash inflows.

6.70 The benefit of VicRoads directing specific attention to the individual elements of a tenderer's bid was sharply illustrated in one of the contracts examined during the audit. In that case, VicRoads identified that, in the lowest 3 tenders, the estimated cost of an important item, the expected quantity of the base layer of fine crushed rock to be used in the works, differed significantly from the engineer's estimate prepared by VicRoads.

6.71 To its credit, VicRoads sought from the 3 tenderers confirmation of the accuracy of their related costings. Two of the tenderers confirmed the correctness of submitted estimates. However, the other tenderer acknowledged that the expected cost of the layer of fine crushed rock had been omitted from the submitted tender and sought agreement from VicRoads that an adjustment of about \$800 000 (or 10 per cent of the contract value) be applied to its bid price. After careful consideration by VicRoads, it decided to accept the adjustment to the submitted tender on the basis of ambiguities in its initial contract documentation. This tenderer was subsequently awarded the contract.

6.72 It can be seen that, in this instance, the comparison of tenders with the engineer's estimate on a line by line basis identified a significant discrepancy. Failure to identify this error could have led to the selection of a tender that was substantially under-priced. It also could have given rise to significant claims for variations to the contract value, with possible adverse risks in terms of the ultimate quality of construction works and the financial viability of the contractor.

6.73 In other examined contracts, less emphasis was directed by evaluation teams to the individual cost elements making up tenderers' price bids. In one contract, many variances of up to 50 per cent between particular cost elements submitted by tenderers and the tender estimates compiled by VicRoads had been documented by the tender evaluation team but there was little evidence to indicate whether any of the variances had been specifically investigated as part of the evaluation process.

6.74 Greater emphasis should be placed within VicRoads on the importance of examination by tender evaluation teams of individual cost elements submitted by tenderers.

Disclosure of quantity estimates to tenderers

6.75 Generally, prime contractors consulted during the audit advised that the quality and quantity of information provided by VicRoads upon which contractor tender submissions are based, were satisfactory. However, a large proportion of contractors indicated a desire for more information concerning quantities of materials required for a project. These contractors expressed the view that such information would be of assistance to them in confirming their own estimates and in reducing the costs of tendering for contracts.

6.76 VicRoads advised during the audit that it has a major concern with providing detailed quantities information in tender documents as such a practice could lead to legal action by tenderers should such information be relied upon in preparing their bids but subsequently prove to be inaccurate.

6.77 On rare occasions, for example the Black Forest component of the Calder Highway project, VicRoads has provided potential tenderers with quantities information in order to assist in expediting the tender submission process. In such cases, VicRoads had addressed its concern over potential legal action by tenderers through the inclusion in tender documentation of an appropriate disclaimer concerning the supplied data.

6.78 Specialists engaged to assist during the audit advised that the provision of quantity information to tenderers, accompanied by an appropriate disclaimer, is a common practice within the building industry.

6.79 It is important to recognise the need for VicRoads to take a conservative stance on this issue in order to adequately protect the interests of the State. However, in view of the potential benefits in terms of lower tendering costs and reduced timeframes for tender preparation, VicRoads could consider the feasibility of providing greater quantities information to potential tenderers in future tender documentation, but supported by an appropriate disclaimer clause.

Other procedural issues raised with VicRoads

6.80 Other matters of a procedural nature relating to the tendering process raised during the audit with VicRoads were:

- Currently, it is the usual practice of VicRoads to require the lowest one or 2 bidders for a contract to submit a statutory declaration attesting that they have not engaged in collusive practices. Widening the ambit of this requirement to encompass all tenderers would further reinforce the strength of the message conveyed by VicRoads that collusive practices are not acceptable; and
- A matter cited in discussions with contractors during the audit was that tender documentation prepared by VicRoads does not disclose the weightings to be applied in the assessment of tender bids to specific evaluation criteria such as price, level of innovation, quality of occupational health and safety strategies, environmental management plans and quality assurance systems. While it could be argued that the formulation of relative weightings is a matter for VicRoads to determine, a broad indication at least of the level of significance attached to particular criteria is likely to result in better prepared tender submissions aligned more closely to the requirements of VicRoads.

□ **RESPONSE** provided by the Chief Executive of VicRoads

Pre-Qualification Scheme

Scrutiny of financial viability

VicRoads sources external advice on the financial status of contractors prior to granting pre-qualification for all pre-qualification categories.

The audit report recommends greater scrutiny of the ongoing financial viability of pre-qualified contractors but does not discuss the cost-effectiveness of such a process. The following matters deserve consideration:

- *A comprehensive review of a contractor's financial status and current commitments is required to provide a realistic assessment of financial capacity to undertake a project. This requires detailed investigation.*
- *The cost of the investigation required needs to be considered in the light of VicRoads exposure to risk in the event of default. The contract provisions for progress payments and VicRoads procedures for administration of these provisions minimise risk of financial loss in relation of completed works, and the contract provisions for performance undertakings are considered to adequately cover additional costs of completing the work*
- *VicRoads has rarely encountered difficulties with contracts because of financial viability of pre-qualified contractors. In the past five years none of the major contractors (level P20) have been unable to meet obligations and only four out of a total of 325 other contracts (i.e. 1.2%) have been terminated because of the contractor's financial difficulties.*
- *Table 6A covers pre-qualification details for both roadwork and bridgework, however the text of paragraph 6.18 refers only to numbers of roadwork pre-qualified contractors. Thirty-three contractors are also pre-qualified under the three levels of bridgework pre-qualification. Many Contractors are included in both the roadwork and bridgework groups.*

❑ **RESPONSE** provided by the Chief Executive of VicRoads - continued

External representation on the Pre-qualification Committee

The audit recommends that consideration be given to appointment of at least one external representative from the road construction industry to reduce any risk that the objectivity of the pre-qualification process could be open to question. In this regard:

- The discussion on the pre-qualification process omits any mention of the checks and balances built in to the current process. New applications for prequalification and applications for review of existing classifications are reviewed by a committee with direct and current experience in road construction and maintenance. The committee's recommendations are then reviewed by the VicRoads Manager Contract Services. The recommendations are then independently reviewed by the Deputy Chief Executive who has the authority to approve all except reductions in prequalification category. The latter must be referred to the Chief Executive for consideration.
- The pre-qualification scheme also provides an avenue for appeals against determinations. The guidelines for the scheme state that an appeals panel will include an external industry representative. However, to date there have been no appeals which indicates a high level of confidence in the current process.

External input to future revision of Pre-qualification Guidelines

The Pre-qualification Guidelines are currently being reviewed in close consultation with representatives nominated by the Civil Contractors Federation and the Australian Constructors Association. As part of this review VicRoads is developing a performance review process to provide a better basis for assessment of strengths and weaknesses and as a means of enabling continuous improvement in both contractor performance and the effectiveness of VicRoads in specifying projects and administering contracts.

However, it is considered inappropriate to extend performance assessment to sub-contractors. Sub-contractor performance is clearly the responsibility of the prime contractor.

Potential benefits from a uniform approach within government

Details of VicRoads Pre-qualification Scheme, including listings of pre-qualified contractors, are available to local government and other agencies within the Department of Infrastructure. In early 2000 full details of the scheme and participants will be published on the internet.

Administration of the Pre-qualification Scheme carries with it an accountability for determinations and for the adequacy of assessment and review process. Whilst VicRoads is prepared to share the information it accepts that this accountability for its own operations cannot be shared.

❑ **RESPONSE** provided by the Chief Executive of VicRoads - continued

Pre-registration and short listing of tenderers for specific projects

As noted in the audit report VicRoads previous Contract Manual has been superseded by a Contract Management System. The current procedure only requires invitations of expressions of interest from prospective tenderers where either there is no relevant pre-qualification scheme in place, or where it is proposed to short-list the field of tenderers.

VicRoads is working with industry representatives to develop a memorandum of understanding on a suitable short listing process that will enable VicRoads to obtain tenders from contractors that have demonstrated the highest levels of performance without unduly restricting opportunity for other prequalified contractors to demonstrate their performance.

Discussions with industry in regard to shortlisting (Paragraphs 6.52 and 6.53 refer) have only related to tendering for major design and construct contracts and more specifically to those design and construct contracts for which tendering costs are significant. For other construction contracts, reliance on the pre-qualification scheme and commercial pressures in the industry to manage the size of tendering lists will continue unless unique contract circumstances dictate otherwise.

Tendering Processes for Major Road Construction Contracts

VicRoads does not appoint evaluation 'panels' to consider tenders. Accountability for consideration of tenders rests clearly with business unit managers who may designate an individual or a team to undertake the assessment, depending on the extent of the task.

VicRoads does not agree with the proposed inclusion of one or more external individuals on tender evaluation teams for the following reasons:

- The process employed by VicRoads minimises subjective assessment of tenders. There are clear procedures for comparative assessment of tenders, in particular the treatment of non conforming proposals.*
- The process for evaluation of major contracts is transparent and has inbuilt safeguards through the independent consecutive assessment of the evaluation by VicRoads Manager Contract Services, the responsible Director, and the Chief Executive. These are separate independent reviews.*
- There have been no complaints or challenges to the probity or adequacy of the evaluation process in at least the past five years.*

The audit report refers to Government guidelines regarding use of independent probity auditors. These are applicable in the case of tendering processes that involve negotiation or significant communication with different tenders, but these considerations do not apply in the case of major construction contracts or design and construction contracts administered by VicRoads. Tender enquiries are responded to in writing, with copies to all tenderers and any negotiation prior to award is only permitted in relation to design aspects of design and construct tender proposals.

VicRoads contract management procedures include comparison of individual price elements of a tender, notwithstanding that tender acceptance is based on the total lump sum and implies no acceptance of a commitment to the individual price elements. A line by line comparison is not always possible for design and construct contracts where there are significant differences in design solutions.

❑ **RESPONSE** provided by the Chief Executive of VicRoads - continued

Tendering Processes for Major Road Construction Contracts - continued

The tender omission referred to in paragraph 6.71 was identified on closing of tenders. Examination revealed an ambiguity in the tender documents and the tenderer was given the option of pricing the omitted item. This process was controlled by the Manager Contract Services under tight probity conditions and was resolved before tenders were released for evaluation.

Paragraphs 6.75 to 6.79 suggest that VicRoads provide more detailed information on quantities to tenderers. On major contracts, VicRoads endeavours, as far as possible, to package the design and construction responsibilities in order to maximise the scope for innovation and competition and to clearly delineate risk and responsibility for achievement of outcomes. On these design and construct contracts the detailed quantities are determined by the contractor after the design phase. The comments in the report are therefore not applicable in these cases. The particular case of the Black Forest contract cited in the report was an exception in that it was not a full design and construct contract.

In relation to paragraph 6.80, VicRoads does not use weightings in tender assessment unless they are explicitly stated in the Conditions of Tendering. The lowest conforming tender is accepted unless an alternative proposal can be demonstrated to offer greater value to the community. The pre-qualification system excludes contractors with unacceptable capability, including management systems for safety and environmental management.

In relation to the issue of management systems raised in paragraph 6.80, VicRoads has over several years arranged and delivered information and training courses for the industry to ensure a proper understanding of its requirements. The training has generally been undertaken jointly with the Civil Contractors Federation.

The indicative pricing of management system items in lump sum tenders is used as a guide in establishing progress payments for development and implementation of quality plans. These indicative prices are not binding on VicRoads.

Part 7

Contract management

OVERVIEW

7.1 In implementing its outsourcing strategy for road construction, VicRoads retains total responsibility on behalf of the Government for the quality and overall efficiency of construction projects.

7.2 Given the scale, complexity and unpredictable nature of road construction works, it is rare for a major contract to be completed without some variations to the scope of the works, normally involving additional cost. Overall, VicRoads was found to have managed contract variations in an appropriate manner and the level of variations was generally in line with industry experience for contracts of a similar nature.

7.3 The presence of certain risks, including the potential for additional costs and litigation action, to VicRoads associated with aggregated claims submitted by contractors at the end of a project can place it in a disadvantageous position in negotiating the settlement of such claims. These risks would be minimised if all claims initially rejected by the relevant project superintendent were subject to timely final resolution by VicRoads on an individual basis.

7.4 VicRoads utilises a range of methods to monitor the performance of contractors including the holding of periodic site meetings, scrutiny of changes to contractors' programs and receipt of monthly reports outlining progress against established milestones. A number of areas requiring improvement were identified in regard to these mechanisms including the need for more regular and effective site meetings, greater attention directed to ensuring that contractors furnish programs of an acceptable standard in a timely manner and a more structured approach to the carrying out of post-contract and post-project evaluations.

7.5 Because of ongoing staff movements and retirements, VicRoads has faced, over recent years, the task of identifying new sources of suitably qualified staff with the necessary hands-on road construction experience to carry out project management and quality assurance responsibilities. VicRoads has responded to this challenge through the creation of a graduate development program which *“evolved from the need for a pool of talented graduates with the potential ability to lead the organisation into the future”*.

7.6 VicRoads should be commended for its graduate development initiative in this important area. However, the future loss of experienced managers has ramifications for VicRoads in terms of ensuring an adequate and ongoing capability for the monitoring of contractors.

7.7 Specialists engaged by audit considered that effective monitoring of contractors requires the involvement of personnel with wide experience in project planning, scheduling of road works, cost estimation and contract administration. It may therefore be necessary for VicRoads to consider additional longer-term staff resourcing strategies for road construction.

IMPORTANCE OF EFFECTIVE CONTRACT MANAGEMENT

7.8 In outsourcing the carrying out of construction works for roads and bridges, VicRoads retains total responsibility on behalf of the Government for the quality of the roads and bridges, and for the overall efficiency of construction projects.

7.9 Because of its position as the State's road construction authority, VicRoads has the important responsibility of ensuring that an effective framework is in place for overseeing contracts and achieving planned outcomes. This Part of the Report focuses on the management processes adopted by VicRoads following the awarding of a contract. It includes the important quality assurance systems utilised by VicRoads during the course of a contract and its approach to post-contract evaluation.

MANAGEMENT OF CONTRACT VARIATIONS

7.10 During the course of the construction phase of a contract, it may be necessary to amend or augment the planned works in order to cater for unforeseen eventualities or a change in requirements. These amendments are affected through *variations* to contracts, a term commonly used in most contractual environments in the private and public sectors.

7.11 Given the scale, complexity and unpredictable nature of road construction works, it is rare for a major contract to be completed without some variations to the scope of the works, normally involving additional cost. In line with industry practice, contracts used by VicRoads for road construction contain variation clauses which set out the agreed basis for authorising and pricing contract variations.

7.12 VicRoads has the task of ensuring that the incidence of contract variations is minimised and any approvals granted for changes to works and associated increases in cost, subsequent to the awarding of contracts, are fully justifiable.

Assessment of the management of variations

7.13 During the audit, a range of contracts, each with a contract sum in excess of \$5 million, were examined with specialist assistance to assess the soundness of the management of variations within VicRoads.

7.14 The results of this examination identified that:

- the basis established by VicRoads for estimating the cost of proposed variations was found to be consistent with general industry practice;
- submissions for variations by contractors were thoroughly reviewed as part of contract management processes; and
- the justification for additional works cited within variations was generally supported by adequate documentation.

7.15 The conclusion reached from this examination was that the overall framework established by VicRoads for the management of variations was appropriate.

Variations arising from subsequent changes to contract requirements

7.16 An examination of contract specifications revealed that there was scope in some cases for better definition of particular areas such as landscaping, noise abatement barriers and aesthetic issues (an example of the latter category would be the general overall appearance of works to road users).

7.17 While it is recognised that clear definition of these areas can often be quite difficult, it is important that as much precision as possible is built into the definitions as any inadequacies within specifications can give rise to a need for significant contract variations following the awarding of the contract. Such variations are essentially negotiated in a non-competitive environment between VicRoads and the contractor, a situation which can have cost implications for VicRoads.

Aggregated claims submitted by contractors

7.18 Major individual claims advanced by contractors for variations are initially examined by the relevant project manager (in the role of project superintendent). For any claims rejected by the superintendent, there is currently no impediment to contractors aggregating these claims and submitting them in total to the Chief Executive Officer of VicRoads for consideration and negotiation. While VicRoads does not encourage claims of this nature, the practice is nevertheless a frequent occurrence with road construction contracts.

7.19 The resolution of aggregated claims will normally constitute the final action by VicRoads in settlement of all outstanding issues pertaining to the particular contract.

7.20 Examples of such claims identified in contracts examined during the audit are set out below:

- South-Eastern Arterial, where a package of 18 separate claims totalling \$13.5 million was settled for \$4 million;
- Western Ring Road, where the contractor advanced a claim of \$8.7 million which was valued by the superintendent at under \$1 million and subsequently settled for \$1.5 million; and
- Ballarat Bypass, where the contractor submitted a claim of \$9.7 million based on breaches of the Trade Practices Act which was ultimately settled between the parties for \$500 000.

7.21 In the case of the Ballarat Bypass, the claim lodged by the contractor alleged that VicRoads had contravened the Trade Practices Act in that there had been misrepresentations made by VicRoads in relation to certain information, for example the allowance for adverse weather conditions and the periods where work was not possible due to the properties of the top soil and silty materials found on site. Negotiations extended for a period in excess of 2 years and the matter was settled out of court. While the final result from the perspective of VicRoads may appear to be favourable, a significant level of in-house resources would have been absorbed during the period of the case.

7.22 A risk to VicRoads from these claims is that they can enable contractors to exert pressure upon the organisation to favourably consider large aggregated claims. Contractors are aware of the fact that it could be to their financial disadvantage to progressively resolve a range of smaller claims as such claims would be subject to a greater degree of individual scrutiny than if they formed part of a larger aggregated claim. Further risks to VicRoads are that significant legal costs can be incurred in reaching settlement between the parties and the absence of a settlement can lead to a hearing in court.

7.23 Specialist advice provided during the audit indicated that the presence of these risks can at times place VicRoads in a disadvantageous position in negotiating the settlement of aggregated claims with contractors.

7.24 In effect, with significant claims lodged by contractors at a level far in excess of the likely settlement amount, there is the potential for VicRoads to incur an overall greater cost than if claims were resolved on an individual basis and in a timely manner. This potential exists even though, as illustrated in the earlier examples, the amount finally agreed between the parties following negotiations is significantly lower than the aggregated value of the submitted claim.

7.25 It is considered that the risks to VicRoads associated with aggregated claims would be minimised if all claims initially rejected by the project superintendent were subject to timely final resolution by the organisation on an individual basis.

7.26 Also, VicRoads should, as a matter of course, assess its experience with aggregated claims (including the circumstances relating to the Ballarat Bypass) to identify any avenues for strengthening policies and procedures and further mitigating organisational risks arising from such claims.

IMPORTANCE OF CONTRACTORS' PROGRAMS

7.27 The fundamental purpose of a road construction contract is to establish a framework of rights and obligations between the parties which is aimed at ensuring that defined works are completed within cost and time targets and to the required quality standards.

7.28 With regard to the time provisions within contracts, a project that is completed late can lead to:

- delays in the commissioning of the project;
- community dissatisfaction with protracted traffic delays and an inability to utilise new roads;
- higher costs to VicRoads such as increased project management and administrative costs and to the contractor in the form of extended plant and equipment hire expenses and other associated outlays; and
- contractual claims by the contractor for delay and disruption costs arising from alleged acts and omissions of VicRoads.

7.29 Contracts entered into by VicRoads specify that “*the contractor shall proceed with the work under the contract with due expedition and without delay*”. To provide a capacity to monitor progress of works, the contractor is required to submit a construction program, known as the *contractor’s program*, which is defined as “*a program in the form of an activity orientated, critical path network which shows how the contractor proposes to complete the works, or a separable part of the works within the period or by the respective dates for practical completion*”.

7.30 Contractors’ programs must be furnished within 28 days of acceptance of a tender by VicRoads. Also, updated programs are required at intervals not exceeding 3 months and within 14 days when any change occurs to the critical path for the contract works.

7.31 Contractors’ programs are therefore a key management tool utilised by VicRoads in monitoring the progress of projects against agreed timelines. They are also a fundamental document used in the assessment of claims by contractors for extensions of time.

7.32 Examination of contractors’ programs identified that:

- While sound efforts were made to encourage the submission of programs within the 28 day period, acceptable submissions were not received on many contracts within this timeframe without substantial amendments requested by VicRoads. For a significant number of contracts, exchanges of correspondence occurred over many months, with superintendents not accepting submitted programs for a variety of reasons including insufficient details, non-compliance with the requirements of the contract or inappropriate representation of allowances for wet weather delays;
- For a number of contracts, extension of time claims were inappropriately approved by the superintendent before finalisation of an acceptable contractor's program;
- While stringent contractual requirements are stipulated for the form and content of programs, these requirements were often not enforced, particularly with projects involving smaller construction companies; and
- VicRoads had not always received periodic updates of contractors’ programs in accordance with the general contractual provisions.

7.33 VicRoads should take appropriate measures to ensure that contractors furnish programs of an acceptable standard in a timely manner and extensions to time are not granted in advance of its approval of programs.

MONITORING THE PROGRESS OF CONSTRUCTION WORKS

7.34 Key mechanisms utilised by VicRoads to monitor the progress of construction works include:

- monthly reports outlining progress against the approved program furnished to it by the appointed contractor; and
- regular (usually monthly) site meetings with the contractor to discuss progress with works, resolve issues and plan future tasks.

7.35 The audit examination of monthly progress reports submitted by contractors found that these reports were generally of a high standard.

7.36 The assessment of the manner in which VicRoads utilises site meetings as an important monitoring tool identified that:

- In many instances, the project superintendent (also the project manager) from VicRoads did not attend site meetings or did so only on an infrequent basis. A general explanation advanced for this practice was that frequent attendance may compromise the independence of the project superintendent as an independent administrator of the contract. In such instances, other senior project staff, including the construction manager or team leader, represented VicRoads at the site meetings. Specialists engaged during the audit considered that attendance by the project superintendent at site meetings was essential in terms of maintaining a current knowledge of progress and issues associated with the construction project;
- The absence at site meetings of project superintendents was highlighted by the fact that representatives of contractors at these meetings were often very senior executives of the construction companies. A continual imbalance of representation at site meetings may not be in the best interests of VicRoads, having regard to the importance of decisions reached between the parties arising from site negotiations;
- The contractual requirement that a documented report on the progress of works be presented by the contractor to the project superintendent at least 2 days prior to the scheduled dates for the meetings was often not complied with and, in many instances, reports had not been requested by the superintendent; and
- Mmeetings were generally held at monthly intervals, a frequency which, based on specialist advice, would not always be conducive to ensuring that emerging issues associated with major projects were identified and addressed in the most timely manner.

7.37 These factors can lead to a weakening of the overall capacity of VicRoads to effectively monitor a contractor's performance. They also impede the ability of VicRoads to pro-actively address the various matters earmarked for discussion at site meetings and which require timely resolution. In such circumstances, contractors may be placed in an advantageous position compared with VicRoads in terms of negotiations at site meetings and the resultant decisions.

POST-CONTRACT AND POST-PROJECT EVALUATIONS

7.38 A key feature of continuous improvement strategies within both private and public sector organisations involves the undertaking of reviews of past performance in particular areas and the feeding of the results of these reviews into the formulation of future plans and strategies. Within the field of road construction, identification of continuous improvement opportunities derived from past experience will normally take into account the results of both post-contract and post-project reviews.

7.39 Post-contract reviews place emphasis on such matters as the degree to which cost and time targets were met, the management of contract variations, soundness of tender estimates, adequacy of attention to environmental issues, effectiveness of interactions with the community and the overall performance of prime contractors and sub-contractors.

7.40 The more embracing post-project reviews focus on the collective outcomes of all contracts including the level of achievement of overall project objectives and an assessment of total cost against targets.

7.41 Although post-project reviews covering 2 major projects examined during the audit were found to be reasonably comprehensive, the carrying out of post-contract and post-project reviews had not been a regular practice within VicRoads. In addition, VicRoads found it difficult to readily locate, for audit examination, documentation supporting past review activities undertaken by the organisation.

7.42 Continuous improvement processes within VicRoads would be enhanced if:

- existing requirements for the conduct of post-contract and post-project reviews were strengthened;
- the reviews were headed by independent external personnel with sufficient road construction knowledge and experience rather than members of the project team; and
- a mechanism was introduced for providing assurance that effective corrective action has been undertaken in response to recommended improvements.

QUALITY AND CONSISTENCY OF FILE DOCUMENTATION

7.43 Most documentation relating to projects and contracts in progress are held by VicRoads outside head office at its regional offices or temporary project offices established at the location of projects.

7.44 An examination of a selection of projects and contracts found that the quality and consistency of the filing of all relevant documentation varied considerably between offices. In many instances, it was quite difficult to readily locate particular documents because of poor structuring and indexing of files.

7.45 The ability of staff within VicRoads to accurately identify relevant and appropriate files and recover them from archives is of added importance because of the long useful lives of roads and bridges and the fact that the potential for legal dispute can be present for many years after final completion of construction works. If, in the event of litigation, any documentation critical to the case cannot be located, the adverse financial consequences to VicRoads could be significant.

7.46 In addition, poor structuring and indexing of files can impact on the capacity of VicRoads to undertake effective post-project and post-contract reviews which, as mentioned in the preceding paragraphs, should be an important element of the organisation's quality assurance processes.

7.47 The need for better documentation was clearly illustrated in the examination of the contract for the Eastern Freeway Extension. The certificate of practical completion had been issued for this contract in September 1997 and the contractor had moved to other projects. The following weaknesses associated with the management of important documentation relating to this contract were identified:

- difficulty in locating significant elements of project documentation such as superintendent's diaries (the prime records of major issues which emerged during the project) and pre-construction drawings of proposed works; and
- *as built drawings*, which define the works as actually constructed and are critical to any future works claims and possible disputation, were still not available some 18 months after finalisation of the project (the contractual provisions provide for these drawings to be made available by the contractor within 12 weeks of completion of works).

7.48 VicRoads should take action to improve the management of its file documentation and ensure that all required processes and records are completed following finalisation of contract works.

RESOURCES AND SKILLS PROFILE

7.49 Because of its longstanding outsourcing policy, considerable downsizing has occurred at VicRoads over the last decade with staff numbers falling from around 6 000 in 1989 to around 2 300 in 1999.

7.50 Despite this progressive decrease in staff numbers, VicRoads retained a number of engineers with considerable hands-on experience in the undertaking of road construction works. These engineers assumed broader project management responsibilities for overseeing construction works outsourced to contractors.

7.51 Because of ongoing staff movements and retirements, VicRoads has faced, over recent years, the task of identifying new sources of suitably qualified staff with the necessary hands-on road construction experience to carry out project management and quality assurance responsibilities.

7.52 VicRoads has responded to this challenge through the creation of a graduate development program which "*evolved from the need for a pool of talented graduates with the potential ability to lead the organisation into the future*". This program incorporates a number of features including:

- recruitment of young graduate engineers;
- providing special opportunities for graduates and other staff to participate in work-experience programs with major engineering consulting firms within the private sector;
- establishing a partnership with the Institution of Engineers Australia which enables graduate engineers to use developmental experience at VicRoads as a means of progress towards Chartered Membership of the Institution (it is understood that this is the first such partnership formed between the Institution and government); and
- regular training courses and professional development activities.

7.53 Recent staffing figures indicate that, of the 60 engineering staff within the Major Projects Division of VicRoads (this division is responsible for major road construction projects), over a third is in the 20-30 year age category.

7.54 VicRoads should be commended for its graduate development initiatives in this important area. The ongoing success of these initiatives will require constant monitoring by the organisation.

7.55 As mentioned earlier, project managers within VicRoads possess extensive direct experience in the various facets of road construction gained from the period prior to the adoption of outsourcing. The future loss of these experienced managers has ramifications for VicRoads in terms of ensuring an adequate and ongoing capability for the monitoring of contractors. Specialists engaged by audit considered that effective monitoring of contractors requires the involvement of personnel with wide experience in project planning, scheduling of road works, cost estimation and contract administration.

7.56 It may therefore be necessary for VicRoads to consider additional longer-term staff resourcing strategies for road construction such as a special lateral recruiting program, secondment arrangements with industry or the possible outsourcing of key project management roles to the private sector.

DEVELOPMENT OF QUALITY SYSTEMS AT VICROADS

7.57 Over recent times, a key direction for VicRoads has been its embracing of quality systems management.

7.58 Detailed examination by a quality system specialist involved in the audit identified that VicRoads has made very significant progress in the introduction of quality systems across its entire range of operations. This examination found that the systems possess significant strengths and have the potential to assist VicRoads in its pursuit of continuous improvement.

7.59 Clearly, VicRoads has progressed significantly in creating a comprehensive quality systems framework which potentially provides the basis for strong management of its road construction activities as well as its other functions. Overall, the quality systems within VicRoads exhibit the following positive features:

- sound systems which build on existing strengths in areas such as project and contract management;
- ownership of quality systems by personnel at all organisational levels;
- well-documented systems which are readily available to all staff;
- a customer focus throughout its quality processes; and
- improved internal audit trails and record keeping.

7.60 In order to realise the full potential for improved performance, VicRoads needs to continue its actions to develop and enhance its quality system framework. The following matters should be considered as part of this process:

- The large number of quality systems currently in place (there are 17 operational systems) increases the risk of duplication of processes, cost inefficiencies and inconsistencies between the various systems. Accordingly, an opportunity exists for VicRoads to rationalise and amalgamate systems within a strategic framework which best aligns systems with core business functions;
- The *Corporate Quality System* has a key focus on facilitating improved organisational performance through its role in providing a framework for major corporate and business activities such as strategic and business planning, management monitoring and reporting, people management, customer service and asset management. The effectiveness of this corporate system would be further enhanced through the establishment of a management and monitoring control framework which:
 - clearly defines management information and reporting requirements and the means of compiling this data;
 - allows for centralised initiation and control of internal review of quality systems; and
 - provides policy directions and guidelines for common areas of other quality systems such as human resource planning, public relations, financial reporting and information systems;
- The *Major Projects Quality System*, which is the linchpin of construction project management, has been recently developed and strengthens organisational processes in terms of internal audit and surveillance, recording, planning and environmental management. To ensure ongoing improvements to this system, it will be important for VicRoads to continue its focus on areas such as:
 - surveillance of contractors involved in construction contracts;
 - the strengthening of processes for the assessment and review of contractor quality systems and for the management of sub-contractors;
 - a stronger focus on post-contract and post-project reviews; and
 - implementation of human resource management strategies to provide for the continued existence of contract and quality management capability; and
- The recently-introduced *Contract Management Quality System* builds upon previous contract management processes through enhancement of the management of tenders and contracts, implementation of a risk-based approach to contract management, improvements to surveillance requirements, and a greater focus on performance objectives and outcomes for contracts. However, the effectiveness of this system would be enhanced by the introduction of a stand-alone review process to identify both weaknesses in the contract management system and cases of non-compliance with system requirements.

7.61 Since August 1998, VicRoads has assessed its operations against the Australian Business Excellence Framework developed by the Australian Quality Council. It expects the results of its ongoing work under this framework to be an important element of the achievement of continuous improvement across the whole organisation.

- ❑ **RESPONSE** provided by the Chief Executive of VicRoads - continued

Management of Contract Variations

The report refers to risks associated with aggregation of claims by contractors during the course of a contract. VicRoads operates under Australian Standard General Conditions of Contract that only require notification by the contractor of a potential claim. Once this notification has been given there is not time limit for submission of the claim details.

Importance of Contractor's Programs

VicRoads has included a condition in standard specifications for design and construct contracts and other lump sum construction contracts requiring submission of a conforming program before VicRoads will make a progress payment.

Post Contract and Post Project Evaluations

VicRoads has implemented quality procedures to ensure systematic review of contract management procedures and documentation and to identify potential areas for improvement. All contracts greater than \$10M plus at least 10 per cent of other contracts exceeding \$100,000 are now to be reviewed annually.

Resources and skills

VicRoads disagrees strongly with the implied assertion that engineers recruited and trained under VicRoads graduate program are unlikely to ever possess the levels of practical experience necessary to effectively monitor the performance of road construction contractors. There is no evidence to support such an assertion.

Part 8

Relationships between prime and sub-contractors

OVERVIEW

8.1 VicRoads places significant reliance on contractors to undertake road construction works. This reliance involves a direct contractual relationship with the prime contractor awarded responsibility for the works and indirect relationships with the myriad of sub-contractors who may be engaged by the prime contractor to undertake various aspects of the entire road construction project.

8.2 In response to a questionnaire issued to sub-contractors during the course of the audit and in subsequent face-to-face interviews with 24 firms, sub-contractors raised a wide range of concerns particularly related to the relationships between prime and sub-contractors in the tendering and administration of road construction projects.

8.3 A major area cited by sub-contractors involved allegations of inappropriate payment practices by prime contractors. Around half of the sub-contractors who responded to the questionnaire indicated that they had suffered financial hardship as a result of prime contractors delaying or not paying moneys due for work performed. Sub-contractors also raised other concerns such as prime contractors, after the awarding of tenders, entering into new rounds of negotiations with sub-contractors to pressure them into reducing their earlier cost bids. Sub-contractors viewed this practice as unethical and limiting the ability of some firms to remain in business.

8.4 In general terms, Victoria has trailed both New South Wales and Queensland in implementing action to address improper building and construction industry practices. The most significant recent action occurred in March 1999 when the former Government issued a revised *Code of Practice for the Building and Construction Industry*. The Code, which is administered by the Department of Infrastructure, sets out the revised minimum standards required of parties seeking government business in the industry. While the new Code represents a definite enhancement compared to the previous position, it could be further strengthened by:

- the assignment of specific responsibility to an independent party for the detection and investigation of Code breaches to supplement the current provisions which rely on the reporting of breaches by industry participants; and
- the stipulation of specific sanctions applicable to breaches of the Code.

8.5 It is emphasised that the matters addressed in this Part of the Report represent views of individuals. It is also recognised that many of the issues focus on the relationship between prime contractors and sub-contractors and extend beyond the direct responsibility of VicRoads. Nevertheless, as the Government's key road construction body, VicRoads should at least consider avenues for becoming aware of any unsatisfactory practices within the industry, given the potential adverse impact of unresolved issues or disputes between contractors on the quality, cost and timeliness of road works.

CONSULTATION BY AUDIT WITH PRIME CONTRACTORS AND SUB-CONTRACTORS

8.6 As referred to throughout this Report, VicRoads places significant reliance on contractors to undertake road construction works. This reliance involves a direct contractual relationship with the prime contractor awarded responsibility for the works and indirect relationships with the myriad of sub-contractors that may be engaged by the prime contractor to undertake various aspects of a project. As such, in addition to prime contractors, sub-contractors play a key role in contributing to the ultimate quality of road construction.

8.7 Part 3 of this Report outlined the processes used by audit to obtain the views of a cross-section of contractors (both prime contractors and sub-contractors) in relation to issues associated with road construction projects in the State. These views were obtained in response to an audit questionnaire, prepared with specialist assistance, and forwarded to contractors as well as from subsequent face-to-face interviews with 24 firms covering both respondents and non-respondents to the audit questionnaire.

8.8 Some of the views expressed by prime contractors on tendering and contract administration processes within VicRoads have been addressed in other Parts of this Report.

8.9 Given the importance of sub-contractors to road construction projects, a major element of this consultative process focused on obtaining the views of firms whose involvement in the road construction industry is normally in the role of sub-contractors.

SUB-CONTRACTOR ISSUES RELATED TO TENDERING

8.10 A number of sub-contractors expressed significant concern with regard to tendering and contracting practices adopted by prime contractors.

Prevalence of practice known as *Dutch Auctions*

8.11 Tender bids submitted by prime contractors to VicRoads must be competitively priced in order to come under serious consideration for selection. In the existing highly competitive industry environment, this situation often leads to very low profit margins for the successful tenderers.

8.12 Sub-contractors advised that, within this competitive environment, they were often asked to submit tenders to prime contractors for components of the contract at minimum prices. However, it was not uncommon that once a prime contractor had been awarded the contract, sub-contractors were approached with new rounds of tenders, for the same work already tendered, with the objective of what one sub-contractor described as “*playing subcontractors against each other and reducing final tender amounts*”. This process was commonly referred to by sub-contractors as *Dutch Auctions*. The winning sub-contractor is then faced with the prospect of having to perform the work at a loss or undertaking various cost-cutting activities aimed at lowering costs with potentially adverse consequences on project quality. Sub-contractors who are most in need of work are especially vulnerable to these practices.

8.13 The practice of negotiating lower prices subsequent to tender submission and especially after a contract has been awarded to a prime contractor is widely viewed within the industry as unethical and limiting the ability of some contractors to remain in business.

Reliance on price as the key criteria for awarding of tenders

8.14 The majority of informants perceived *lowest price* to be the fundamental selection criteria used by prime contractors to select winning tenders. It was indicated that a high reliance on price does not necessarily ensure the selection of the most appropriate bid. Many firms have significant overhead costs such as those relating to quality assurance systems, research and development, and employee training and consider it extremely difficult to compete on price against what were referred to as “*backyard or panel van operators*”.

8.15 Sub-contractors believed that VicRoads has a role to play in ensuring that prime contractors, when assessing tenders, place greater levels of importance on qualitative criteria directly related to a firm’s capacity to undertake the work. Two alternative methods of evaluating tenders suggested by sub-contractors, based on their experience elsewhere, were:

- The use of a points system where price is only one of several criteria used to assess tender bids. It was advised that such a system is currently utilised in South Australia and Tasmania; and
- The 2 envelope tender process, where all tender bids submitted by sub-contractors are received and evaluated in 2 distinct parts: one containing qualitative details of tenders with the other, considered only after the first stage is concluded, dealing with the proposed price.

8.16 It was considered that adoption of these practices would not only focus tender decisions by prime contractors on qualitative matters but would also help in raising ethical standards within the industry.

Suitability of contractual documentation

8.17 Several sub-contractors raised the issue of the unsatisfactory nature of contracts and agreements entered into with prime contractors. They indicated that, in many instances, the contract or agreement was represented by no more than a simple work order, which lacked formalised terms and conditions governing the rights and obligations of the contracting parties and mechanisms to be used for the resolution of disputes.

8.18 In one instance advised to audit, a multi-million dollar agreement between a prime contractor and a sub-contractor for an important component of a project was entered into on the basis of a brief work order. The works under this project were subsequently the subject of a dispute between the parties which, because of the absence of clearly-defined contractual terms and conditions, has now proceeded to court for resolution.

8.19 At the other extreme, sub-contractors cited instances of overly-complicated contracts. Because of the limited resources available to sub-contractors to scrutinise complex terms and conditions prior to signing of contracts, most contracts were heavily biased towards prime contractors. In addition, it was felt there was a need for greater similarity between terms and conditions within contracts between VicRoads and prime contractors and those entered into with sub-contractors.

8.20 Overall, many sub-contractors indicated that they would welcome development by the industry of a simple, easy to understand contract which was legally binding on parties.

Quality and quantity of tender information provided to sub-contractors

8.21 Generally, sub-contractors rated the information provided to them by prime contractors for tender preparation as between adequate and good in the areas of designs, drawings and specifications. However, significant improvements were considered to be necessary with respect to information made available on anticipated quantities of materials needed on projects, bidding conditions and the evaluative criteria to be employed in the tender assessment process.

8.22 Sub-contractors claimed that quite often project drawings, designs, specifications and schedules of quantities prepared by prime contractors contained significant mistakes and anomalies. Also, information was often left out to keep tender bids low and to lock-in a sub-contractor or supplier to a low contract price. This practice makes it difficult for bidding firms to establish an accurate quote. Where insufficient information led to tendering errors, sub-contractors were forced to accept the resultant risks and were denied the right to seek contract variations. Moreover, another disincentive as viewed by sub-contractors was the additional cost incurred when preparing bids in instances where accurate details on quantities are not provided by prime contractors.

Timeframes allowed for preparation of tenders

8.23 Sub-contractors generally consider timeframes allowed by prime contractors for the submission of tenders to be somewhat short, whereas the post-tender negotiation period prior to the awarding of tenders is generally considered about right. Many sub-contractors indicated that they were often given limited time to prepare quotes and tender bids for certain prime contractors. In these situations, errors may be made by tenderers who have been required to rush their tender bids. Tenderers also indicated that they incur additional costs as a consequence of having employees work late hours and employing consultants to assist in the preparation of tenders in order to meet short deadlines. Many firms have indicated they choose not to quote for jobs if the timeframes allowed are unrealistic. It was felt that, if the timeframes provided by prime contractors were extended, it would encourage more contractors to bid and to improve the quality and accuracy of their submitted documentation.

8.24 In some cases, sub-contractors indicated they have submitted tenders to prime contractors, but have not been informed that they were successful until many months afterwards, often just prior to the commencement of work.

Openness to innovative ideas and alleged misuse of intellectual property

8.25 Sub-contractors generally believe that prime contractors are quite receptive to innovative ideas aimed at enhancing designs, specifications and construction techniques, particularly if they result in cost savings. On the other hand, they considered that prime contractors are not prepared to pay any additional costs or accept risks associated with these innovative ideas.

8.26 Many informants expressed reservations in disclosing details of innovative ideas to other parties fearing the details, often involving valuable intellectual property, would be disclosed to competitors as a means of attaining a lower tender price. In their opinion, this mistrust acts as a disincentive for sub-contractors to pro-actively put forward ideas to prime contractors on methods and techniques which could further improve road and bridge construction in the State.

8.27 The audit team was informed of one instance in which a sub-contractor was requested to prepare a design for works and a tender price for a component of a road construction project. Having forwarded the design and tender bid to the prime contractor, the sub-contractor was asked by another competitor if he could assist that competitor in estimating the cost of work required to carry out a specific design. The sub-contractor was very concerned to discover that this design was an exact replica of the design which the sub-contractor had previously forwarded to the prime contractor.

8.28 Respondents were very strong in their view that the misuse of intellectual property such as designs was clearly unethical practice. The respondents indicated that they would favour the establishment of a timely and cost-efficient framework to facilitate matters relating to the copyright or the patenting of intellectual property applicable to road and bridge construction.

Pre-tender briefings

8.29 Pre-tender briefings between prime contractors and sub-contractors are intended to assist in the preparation of tender bids and to ensure the roles and responsibilities of all persons who may work on a project are clear. Sub-contractors advised that, when held, these meetings were generally considered to be satisfactory.

8.30 However, many sub-contractors indicated that these briefings are extremely rare and were focused more upon obtaining a reduction in tender prices than on achieving an enhanced definition of the scope and requirements of a project.

CONTRACTUAL RELATIONSHIPS BETWEEN PRIME AND SUB-CONTRACTORS

Concerns over payments to sub-contractors

8.31 The non-payment, late payment or part only payment of accounts by prime contractors comprised the predominant issue of concern commented upon by sub-contractors. Around half of the sub-contractors who responded to the questionnaire distributed by audit indicated they had suffered financial hardship as a result of prime contractors delaying or not paying moneys due for work performed. According to responses received, some prime contractors continually failed to meet payment terms and several sub-contractors had substantial moneys outstanding dating back several years. Some sub-contractors indicated that they were no longer prepared to work for certain prime contractors as a result of poor payment histories.

Developments elsewhere in Australia on this issue

8.32 The late or non-payment of accounts within the building and construction industry is an issue that has been raised as a concern at a national level. In January 1996, a Construction Ministers' Council was held to discuss various construction industry matters which ultimately led to the issue in 1997 of the *National Code of Practice for the Construction Industry*.

8.33 As a result of issues raised by the Gyles Royal Commission, in October 1996 the New South Wales Government issued a paper entitled *Security of payment in the Construction Industry*. In this paper, the NSW Government expressed its belief that security of payment was an issue which warranted specific and concerted action. This paper stated that:

“The problem is not a new one. But, while various steps have been taken to deal with the issue, it remains one with an unacceptable profile and impact in the construction industry. It tarnishes the image of the industry, it puts projects in jeopardy and it causes human hardship.”

8.34 The NSW paper attributed the non-payment of moneys owed to other parties lower in the contractual chain as another symptom of problems that stem from:

- poor ethical conduct;
- deficient management skills;
- weak financial backing; and
- an adversarial culture which exists throughout the industry.

8.35 The paper also identified many areas of proposed action with regard to this matter. In response to the findings, the NSW Government announced in February 1999 a reform package which was aimed at achieving a fairer deal for all participants in the NSW building and construction industry. The package included a bill, the Building and Construction Industry Security of Payment Bill 1999, which the NSW Parliament assented to on 6 October 1999.

8.36 The object of this legislation is “to ensure that any person who carries out construction work (or who supplies related goods and services) under a construction contract is entitled to receive, and is able to recover, specified progress payments in relation to the carrying out of such work and the supplying of such goods and services”. The legislation ensures the recovery of progress payments by establishing a claims process and the referral of any disputed claims to an adjudicator for determination.

8.37 The Queensland Government has also been active in addressing this issue through the implementation in July 1998 of a major reform package for the State’s building industry. This package followed previous reforms stemming from a report completed following a 1996 government commission of inquiry into security of payment in the building industry in Queensland.

Recent developments in Victoria

8.38 In general terms, Victoria has trailed both New South Wales and Queensland with regard to implementing action to address building and construction industry practices. The most significant recent action occurred in March 1999 when the former government released the *Code of Practice for the Building and Construction Industry*. The Code superseded the previous Code of Practice issued in July 1994 and sets out the revised minimum standards required to be upheld by those seeking government business. The Code does not specifically refer to the payment of contractors but instead requires all parties to conform to legal and contractual arrangements, which in turn would incorporate payment provisions.

8.39 While the revised Code of Practice represents an enhancement to the previous Code, a number of further improvements could be made by strengthening the provisions relating to:

Enforcement

- The investigation of breaches of the Code relies on the reporting of alleged breaches to the Secretary of the Department of Infrastructure. However, in view of fears by sub-contractors of jeopardising future work in the industry if a complaint is made, it is likely that the number of reports of alleged breaches of the Code of practice would be minimal when compared with actual breaches. Incorporation of specific provisions covering the detection and investigation of breaches within the enforcement mechanisms of the Code would provide a more effective means of identifying and managing unacceptable practices, including matters relating to the settlement of accounts, within the industry.

Sanctions

- The Code stipulates that the scope of sanctions imposed for proven breaches will depend on the nature of the breach and be subject to the discretion of the Secretary of the Department of Infrastructure. However, the Code is general in nature with reference to sanctions and does not clearly outline specific penalties for breaches of the various requirements of the Code. Industry participants are likely to be more aware of the seriousness of breaches of the Code if sanctions were more clearly stipulated.

Policy position of VicRoads

8.40 To date, VicRoads has not implemented specific mechanisms to detect breaches of the Code by both prime contractors and sub-contractors. In relation to the specific matter of non-payment of accounts by prime contractors, VicRoads, as part of longstanding practice, has included the following clause in its general conditions of contracts with prime contractors :

“Not earlier than 14 days after the Contractor has made each claim for payment under clause 42.1, and before the Principal [VicRoads] makes that payment to the Contractor, the Contractor shall give to the Superintendent a statutory declaration by the Contractor or, where the Contractor is a Corporation, by a representative of the Contractor, who is in a position to know the facts declared, that all subcontractors have been paid all moneys due and payable to them in respect of work under the contract.”

8.41 Notwithstanding this specific contractual requirement, it is common for contractors not to provide the necessary statutory declaration unless specifically requested to do so by VicRoads. Such requests are made by VicRoads on relatively rare occasions and generally only when a complaint is received from a sub-contractor.

8.42 This position is hardly satisfactory and, as a minimum, VicRoads should ensure that statutory declarations are provided as a matter of course by prime contractors.

Suggestions for enhancing dispute resolution processes

8.43 Sub-contractors raised concerns at the tendency during disputes of the more powerful contracting firms to bypass mediation or arbitration and move directly to court proceedings. The high costs involved in legal proceedings were seen as prohibiting many of the smaller sub-contractors from challenging prime contractors and fully exercising their rights in settlement of disputes. As a result, many disputes are likely to remain unresolved which often favours the prime contractor.

8.44 An indication of the degree of concern held by sub-contractors in relation to this subject was demonstrated by their many suggestions for enhancing dispute resolution processes within the industry. These suggestions, several of which focus on policy matters for government, were as follows:

- establishment of an expert quasi-judicial tribunal or commission to deal with disputes in a more timely and affordable manner;
- greater use of existing mechanisms such as the Institute of Arbitrators and Mediators prior to referring matters to court;
- the introduction of an industry ombudsman to independently and objectively investigate complaints and make recommendations;
- more informative guidance to smaller contractors on the availability of dispute resolution mechanisms;
- the introduction of simplified, easy to comprehend contracts;
- a greater equality in the allocation of contract risks between prime and sub-contractors;

- provision of avenues to encourage an increased level of direct access by sub-contractors to VicRoads;
- the creation of a government unit similar to the newly-established Residential Tenancies Bond Authority to receive and manage contract security deposits associated with road construction contracts;
- a mechanism for contractors to obtain payment for completed work not subject to a dispute while a dispute covering other segments remains unresolved; and
- the application of penalty clauses in instances where progress payments by prime contractors are unnecessarily delayed.

8.45 It would be appropriate for the Government to consider these suggested options for enhancing current dispute resolution mechanisms within the industry.

OTHER ISSUES RAISED BY SUB-CONTRACTORS

Level of co-operation between VicRoads, prime contractors and sub-contractors

8.46 Sub-contractors considered the level of co-operation received from the staff of VicRoads during the course of a road construction project was quite acceptable.

8.47 Nevertheless, some sub-contractors believed that they were restricted to dealing with staff of VicRoads at the work site alone, and considered that it would be beneficial to have more avenues of access to senior staff of VicRoads in instances where they wished to seek clarification or resolution of matters.

8.48 The issue of the extent to which it is appropriate, indeed legally possible, for staff within VicRoads to interact with sub-contractors directly was raised with VicRoads and contractors during the audit. In essence, VicRoads maintained that its contractual relationships are with the prime contractors. It explained that it has no contractual obligations with sub-contractors who enter into quite separate and distinct contractual arrangements with the prime contractor. VicRoads also considers that any direct involvement by it with sub-contractors could result in an exposure to potential legal action against it by prime contractors in the event of contractual disputes.

8.49 While it is not appropriate for VicRoads to intervene to any great extent in the contractual relationship between prime and sub-contractors, it is essential that it always leaves open the option of direct communication with sub-contractors. In this regard, VicRoads needs to monitor any potential problems or disputes which may have an impact on the quality of the road or the ability of parties participating in contracts to complete the works on time and within budget. This view is consistent with the findings of the *Gyles Royal Commission into productivity in the building industry in NSW* which stated in its report that:

“The actual builders are the subcontractors and their labour. The lion’s share of the money goes to the suppliers of building materials, plant and equipment. Consultants have as much stake in the process as head contractors. This is the profile for significant commercial projects. ... In my view, the way forward is to take the current linear and divided process which starts with the client and its financier at one end and ends with the building materials supplier at the other, with each linkage a point of conflict, and convert it to a circular process, involving all of the stakeholders and giving full weight to each stake. In such a circular process the goals and objectives are common or shared and means are found to work cooperatively to reach those goals or objectives with something for everybody along the way.”

8.50 The principles outlined by the Royal Commission are directly applicable to the Victorian environment.

8.51 Overall, VicRoads needs to forge closer co-operative relationships with all parties engaged in road construction projects without unduly interfering with the contractual obligations of the prime contractors and sub-contracting parties.

❑ **RESPONSE** provided by the Chief Executive of VicRoads - continued

Relationships between Parties

VicRoads has for many years arranged regular forums with industry to discuss issues of concern to all parties. This currently occurs through a quarterly forum between VicRoads directors and nominated representatives of the Civil Contractors Federation and the Australian Constructors Association.

The General Conditions of Contract used by VicRoads mandate compliance with the ‘Code of Practice for the Building and Construction Industry’. Further, VicRoads has determined, after consultation with representatives of civil construction industry associations, to incorporate specific requirements in its prequalification scheme. As from December 1999 contractors will be required to demonstrate that their quality systems include procedures that can assure compliance with the Code of Practice requirements regarding sub-contract agreements, sub-contract bidding practices and payment of sub-contractors.

In relation to the payment issue raised in paragraph 8.41. Contractors are now required to submit the required declaration prior to payment of any progress claim.

The matters raised in paragraph 8.45 will be discussed with representatives of the Civil Contractors Federation and the Australian Constructor’s Federation, but VicRoads considers it would be inappropriate to intervene in the relationship between contractors and sub-contractors.

Part 9

Performance measurement and reporting

OVERVIEW

9.1 Major difficulties exist in establishing high-level performance measures directly related to road construction. The substantial number of road works and developments each year, the complexity and long-term nature of major road construction projects and an inability to attribute resultant community benefits solely to road construction in isolation of other initiatives, such as road safety programs, all contribute to these difficulties.

9.2 VicRoads currently reports on its road management activities within a framework of national performance indicators for State road authorities established by the Association of Australian and New Zealand Road Transport and Traffic Authorities (Austroads).

9.3 The development of a framework of national performance indicators has proved to be a valuable initiative taken by the road authorities to introduce a uniform approach for the measurement of performance within States. It also assists road authorities in identifying specific areas with potential for achieving further improvements in their operations.

9.4 Several important qualifications have to be applied to the national performance framework when forming judgements on the quality of Victoria's overall performance. In this regard, it is difficult to form a definitive conclusion on the relative performance of each State road authority under the framework because of:

- the unique characteristics of the road network and road construction environment within each State;
- differences in the methods utilised by the various road authorities in the compilation of data; and
- the absence of independent assurance on the completeness and accuracy of material submitted by the authorities to Austroads.

9.5 In terms of road construction, there are only 2 indicators of direct relevance within the national framework: one comparing anticipated benefits of projects with predicted costs, and the other aiming to compare benefits ultimately realised and final actual costs with the earlier predictions.

9.6 On the basis of the information reported by Austroads, VicRoads can be considered to be performing well in planning and prioritising road construction projects expected to provide high levels of economic benefits to the community. However, because of measurement difficulties, the national framework has not, to date, presented information on the extent to which predicted benefits are ultimately realised.

9.7 A number of other indicators not solely linked to road construction but providing some indication of construction outcomes form part of the national framework. These indicators deal with a range of road safety statistics, the level of roughness of road surfaces, information on traffic noise exposure and the extent of user satisfaction.

OVERVIEW - *continued*

9.8 Again based on the data reported by Austroads, Victoria can be considered to have national highways which, in terms of surface smoothness, are better than those in all other States. In addition, it had the highest level of road user satisfaction in comparison with other States based on a 1998 survey conducted by Austroads which measured factors such as road width, roughness and lighting.

9.9 On the other hand, the latest available data from Austroads on traffic noise exposure indicates that, in 1997-98, around 14 per cent of Melbourne dwellings (an increase from 9 per cent in 1996-97) were exposed to traffic noise levels higher than the acceptable industry standard. This level of exposure of the Victorian community to traffic noise was the highest of all States. VicRoads attributes this position to the urban form of Melbourne and traffic volumes on arterial roads arising from a restricted capacity to divert heavy transport vehicles from residential areas to freeways.

9.10 The 1998-99 annual report presented by VicRoads to the Parliament provides a wide range of meaningful information covering the organisation's activities. However, much of the contents encompasses road management matters generally and very little performance material, for example actual achievements against advance targets relating specifically to road construction, is contained in the document. There is therefore scope for VicRoads to strengthen the line of accountability to the Parliament and community on its periodic performance in the specific area of road construction. Several suggestions for improving the quality of performance data conveyed annually to the Parliament are outlined in this Part.

9.11 In addition to annual reports presented to Parliament, the annual budget papers, which present data on an output basis, constitute a further source of information on performance targets set by government agencies. Several avenues are available to VicRoads for improving the usefulness of road construction output measures and targets incorporated within the budget papers.

FRAMEWORK OF NATIONAL PERFORMANCE INDICATORS

9.12 Major difficulties exist in establishing meaningful performance measures directly related to road construction. Particular factors which contribute to these difficulties include:

- problems associated with producing a manageable set of high-level indicators capable of clearly measuring the extent to which a wide range of anticipated benefits, which may vary considerably between projects, have actually been realised;
- the long-term nature of major road construction projects, with timeframes for projects extending for periods up to and beyond 10 years between initial planning and completion of construction; and
- an inability to attribute benefits such as enhanced travel conditions solely to road construction in isolation of other initiatives within the State, such as road safety programs.

9.13 Against this background, VicRoads, in conjunction with other road authorities across Australia and New Zealand, began action to establish a common set of performance indicators for matters associated with roads. This action culminated in 1993 with the establishment, by the Association of Australian and New Zealand Road Transport and Traffic Authorities (known as Austroads), of a framework of national performance indicators for road authorities.

9.14 The performance indicators utilised by Austroads encompass a wide range of areas associated with the road system including road safety, road construction and maintenance, travel times and environmental factors.

9.15 Austroads publishes annual reports incorporating data provided by all Australian States and New Zealand on the performance of road authorities over a 4 year period against the established performance indicators. Its most recent report, *Australian and New Zealand Road System and Road Authorities 1998 - National Performance Indicators*, was published in May 1999 and deals mainly with the period 1994-95 to 1997-98.

9.16 Austroads and the various road authorities are committed to ongoing improvement to the national performance measurement framework through refinement of existing indicators and the progressive introduction of new indicators to cover additional or emerging aspects of road systems. As an important expansion of the framework, Austroads in 1998 introduced a *User Satisfaction Index* which is derived from a statistical survey of road users' ratings of a large number of attributes related to the road system within each State. Many of these attributes, such as lane width, absence of dangerous curves, road signs, ease of overtaking and the minimising of environmental damage during construction do not yet feature as specific indicators in their own right.

9.17 This commitment to continuous enhancement of the performance framework is positive as some limitations currently exist in the national indicators, particularly from the specific viewpoint of the quality or efficiency of road construction. In this regard, the framework contains very few indicators with direct relevance to the outcomes of road construction projects. Furthermore, the information reported under the framework does not differentiate between established roads and roads constructed in more recent times.

9.18 It is also difficult to form reliable judgments on the relative performance of each state road authority under the national framework because of:

- the unique characteristics of the road network and road construction environment within each State;
- differences in the methods utilised by the various road authorities in the compilation of data; and
- the absence of independent assurance on the completeness and accuracy of material submitted by the authorities to Austroads.

9.19 Notwithstanding these shortcomings, the development of a framework of national performance indicators has proved to be a valuable initiative taken by the road authorities to introduce a uniform approach for the measurement of performance within States. It also assists road authorities in identifying specific areas with potential for achieving further improvements in their operations.

NATIONAL PERFORMANCE INDICATORS WITH DIRECT RELEVANCE TO ROAD CONSTRUCTION

9.20 The 2 national performance indicators with a direct relationship to the management by VicRoads of road construction projects are:

- *return on construction expenditure*, which compares the anticipated benefits of projects with the predicted costs of projects; and
- *achievement index*, which aims to compare economic benefits and costs predicted at commencement of a project with those actually realised following project completion.

Return on construction expenditure

9.21 In essence, *return on construction expenditure* identifies the predicted economic benefits to a community from estimated capital expenditure on the State's road network. Benefits are calculated according to guidelines issued by Austroads and include:

- for all projects - reductions in costs associated with road use, travel times, operation of vehicles and accidents; and
- for larger projects - estimated macro-economic flow-on benefits to industry.

9.22 A range of less tangible benefits, such as lower human and trauma costs of accidents and social and environmental gains, are not included in the calculation of this indicator.

9.23 The indicator consolidates the ratios of anticipated benefits of individual projects, quantified in dollar terms, to predicted costs of the projects, determined before project commencement. To enable quantification on a consistent basis, Austroads has defined methods to be used to allocate values to a range of benefits and costs associated with road construction projects.

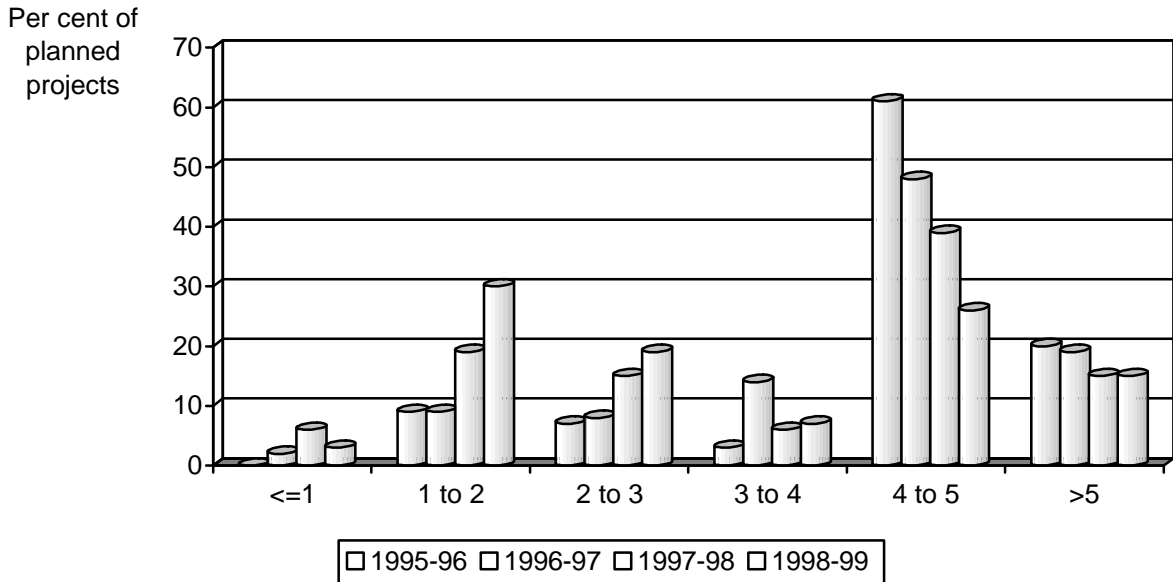
9.24 The 1999 publication by Austroads of national performance indicators categorises performance under the *return on construction expenditure* in the manner shown in Table 9A.

**TABLE 9A
CATEGORIES OF PERFORMANCE FOR
RETURN ON CONSTRUCTION EXPENDITURE**

<i>Result</i>	<i>Assessed expected performance</i>
Greater than 5	Percentage of contracts in which the estimated benefits are more than 5 times the level of estimated costs.
Between 4 and 5	Percentage of contracts in which the estimated benefits are between 4 and 5 times the level of estimated costs.
Between 3 and 4	As above but with estimated benefits between 3 and 4 times the level of costs.
Between 2 and 3	As above but with estimated benefits between 2 and 3 times the level of costs.
Between 1 and 2	As above but with estimated benefits between 1 and 2 times the level of costs.
Less than 1	As above but with estimated benefits less than the level of costs.

9.25 Chart 9B below illustrates the performance of Victoria in relation to the *return on construction expenditure* for projects programmed for expenditure in each of the 4 years 1995-96 to 1998-99.

**CHART 9B
RETURN ON CONSTRUCTION
PROGRAMMED EXPENDITURE FOR VICTORIA,
1995-96 TO 1998-99(a)**



(a) Data based on:
 1995-96 - 75 planned projects representing \$164 million of estimated capital expenditure;
 1996-97 - 168 planned projects representing \$211 million of estimated capital expenditure;
 1997-98 - 230 planned projects representing \$246 million of estimated capital expenditure; and
 1998-99 - 191 planned projects representing \$187 million of estimated capital expenditure.
 A degree of overlap exists between successive years in respect of projects to which funding is allocated in more than 1 year.

Source: *National Performance Indicators, 1998*, Australian and New Zealand Road System and Road Authorities (Austroads) Sydney, 1999.

9.26 Analysis of the data presented in Chart 9B revealed that, at the time of planning, Victorian road construction projects are expected to provide high levels of benefits to the community. In particular, the analysis showed that:

- overall, predicted benefits of projects exceed anticipated costs in virtually all projects planned over the last 4 financial years; and
- the aggregate proportion of projects with expected benefits more than 3 times the level of anticipated costs was as high as 84 per cent in 1995-96 and, despite a sharp subsequent fall, was still reasonably high at 48 per cent in 1998-99.

9.27 Chart 9B also shows the level of variations that can occur from year-to-year in the comparison of benefits with costs for planned projects. These variations may be directly linked to the number, size and complexity of projects planned for commencement in any one year and to changes in the quantum of available funding. The high proportion of projects in 1995-96 expected to generate substantial net benefits was influenced by the relatively small number of higher cost projects included in that year's calculations. Higher value projects often have higher levels of anticipated benefits.

9.28 The performance of the State in undertaking road construction projects with anticipated positive net benefits is also illustrated by comparison of its performance in this area with other Australian States. Victoria's position for planned projects has compared favourably with other States for the 4 year period. For 1998-99, Victoria had:

- with the exception of Queensland, the highest proportion of projects with anticipated benefits exceeding costs by more than 4 times; and
- the lowest level of projects in which anticipated costs exceeded envisaged benefits.

9.29 A distinct shortcoming with this indicator is that it deals solely with future expectations. While it may be comforting for taxpayers to know that net benefits are forecast for major outlays on road construction, it would be even more important for them to be later informed on whether predicted benefits are actually realised. As the commentary in the following paragraphs on the *achievement index* indicates, that national performance indicator does not present information on actual benefits because of measurement difficulties.

9.30 Nevertheless, on the basis of the information reported by Austroads, Victoria can be considered to be performing well in planning and prioritising road projects intended to provide the community with a significant return on its capital investment.

Achievement index

9.31 As its name implies, the *achievement index* focuses on the ultimate achievement of predicted benefits and costs. It aims to compare benefits ultimately realised from road projects and final actual costs with anticipated benefits and costs. However, in practice, VicRoads, in common with other State road authorities participating in Austroads, does not quantify actual benefits derived from completed projects due to difficulties in accurately measuring subsequent benefits particularly when, in many cases, benefits will emerge over a long period of time.

9.32 With actual benefits not measured, data reported under the national framework for the *achievement index* is restricted to the ratio of actual project costs to predicted costs.

9.33 The May 1999 publication by Austroads of national performance indicators categorises performance under the *achievement index* in the manner shown in Table 9C.

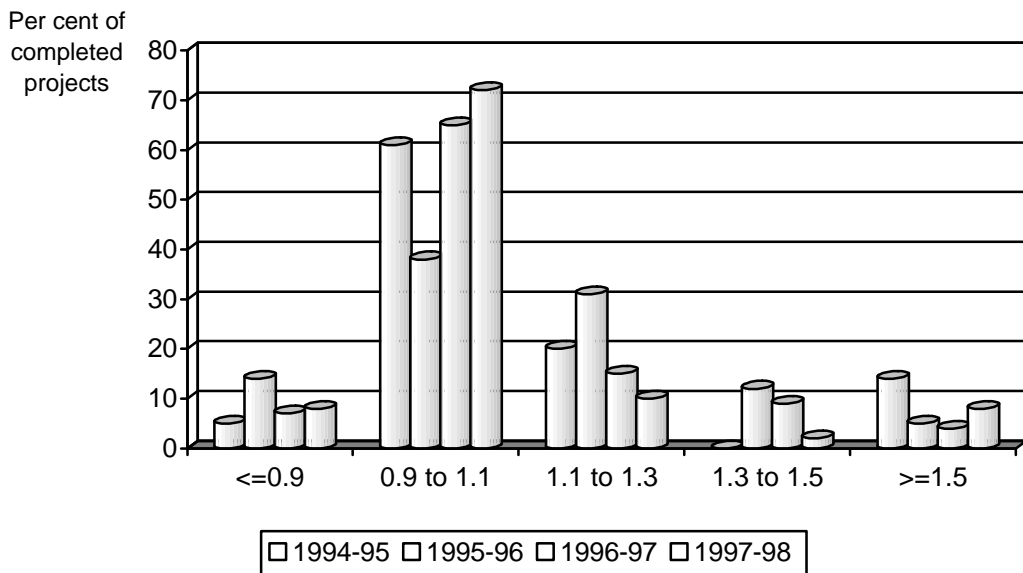
**TABLE 9C
CATEGORIES OF PERFORMANCE FOR
ACHIEVEMENT INDEX**

Result	Assessed performance
Less than 0.9	Actual cost less than 90 per cent of predicted cost.
Between 0.9 and 1.1	Actual cost within the range of plus or minus 10 per cent of predicted cost.
Between 1.1 and 1.3	Actual cost exceeds predicted cost by between 10 and 30 per cent.
Between 1.3 and 1.5	Actual cost exceeds predicted cost by between 30 and 50 per cent.
Greater than 1.5	Actual cost exceeds predicted cost by more than 50 per cent.

9.34 It can be seen that a value greater than one calculated for this index indicates that actual project costs proved to be greater than original cost estimates.

9.35 Chart 9D below illustrates the calculated position for Victoria in relation to the *achievement index* for the 4 year period 1994-95 to 1997-98.

**CHART 9D
ACHIEVEMENT INDEX, VICTORIA
1994-95 TO 1997-98**



Source: National Performance Indicators, 1998, Australian and New Zealand Road System and Road Authorities (Austroads) Sydney, 1999.

9.36 Chart 9D shows that the actual costs of projects managed by VicRoads are generally comparable with the costs anticipated at commencement of the projects. Over 72 per cent of the number of completed projects for 1997-98 reported by VicRoads to Austroads (128 of 193 completed projects) fell within the measurement range of 0.9 to 1.1. This position indicates that actual costs on those projects were within plus or minus 10 per cent of estimated costs, a variance considered by specialists assisting during the audit as acceptable within the road construction industry.

9.37 The results identified by the *achievement index* could be interpreted as indicative of effective financial and project management by VicRoads. However, similar to the position identified earlier with the *return on construction expenditure*, the index has distinct limitations as a measure of performance given that:

- the index is based solely on the ratio of actual project costs to predicted costs and does not, because of measurement difficulties, present information on the extent to which predicted benefits are ultimately realised;
- the index calculations, as performed by VicRoads and submitted to Austroads, do not take into account all projects completed during the year (only large projects where a benefit:cost ratio is available are included in the calculations); and
- the usefulness of the index is highly dependent on the accuracy of initial project cost estimates and the adoption of a consistent approach to calculation of both estimates and actual costs.

9.38 VicRoads should examine, in conjunction with Austroads, the above limitations and take the necessary action to improve the usefulness of the *achievement index* as a measure of its performance in road construction.

OTHER BROADER NATIONAL PERFORMANCE INDICATORS WITH SOME RELEVANCE TO ROAD CONSTRUCTION

9.39 A number of other indicators, not solely linked to road construction but providing some indication of construction outcomes, are compiled annually by State road authorities and brought together by Austroads for external reporting. These indicators include:

- *road safety statistics* for Victoria as a whole, including indicators associated with serious casualty crashes, road fatalities, persons hospitalised and the social cost of serious casualty crashes;
- *smooth travel exposure*, reflecting the roughness of road surfaces within the road system managed by VicRoads;
- *traffic noise exposure* based on a random sample of dwellings within the Melbourne metropolitan area; and
- *user satisfaction* drawing on the results of a telephone survey of 400 Victorian road users aged 17 years and over.

9.40 Data compiled for these indicators is generally based on an average of results over large sections of a road network. Factors other than construction quality such as travel patterns, traffic volumes, adequacy of maintenance programs, driver behaviour, police initiatives, socio-economic factors and major weather patterns are reflected in the compilation of the data. However, the areas measured by the indicators are specific factors considered in the planning of road construction projects. Accordingly, it would be expected that if road projects have been correctly selected, planned and implemented, data associated with these indicators would reveal steady improvements over time.

Road safety statistics

9.41 A range of *road safety statistics* for Victoria is compiled annually by VicRoads, using data extracted from police accident reports, and is reported by Austroads.

9.42 Table 9E presents the statistics for the various road safety indicators reported by Austroads for the calendar years 1995 to 1997 (the most recent year for which nationwide data has been developed and reported). The table also includes 1998 figures for Victoria which were made available by VicRoads during the course of the audit.

**TABLE 9E
ROAD SAFETY STATISTICS, VICTORIA
1995 to 1998**

Indicator	Victoria			Australian Average 1997	Victoria 1998
	1995	1996	1997		
Serious Casualty Crashes <i>per 100,000 population</i>	117.5	114.4	109.1	100.5	116.7
Serious Casualty Crashes <i>per 100 million vehicle kilometres travelled</i>	12.5	12.2	11.6	10.7	12.3
Road Fatalities <i>per 100,000 population</i>	9.3	9.1	8.2	9.5	8.4
Road Fatalities <i>per 100 million vehicle kilometres travelled</i>	0.98	0.97	0.87	1.01	0.88
Persons Hospitalised <i>per 100,000 population</i>	135.5	133.2	125.7	115.4	135.1
Persons Hospitalised <i>per 100 million vehicle kilometres travelled</i>	14.4	14.2	13.4	12.2	14.2
Social Cost of Serious Casualty Crashes \$million per 100,000 <i>population</i>	28.42	27.68	26.4	24.32	26.13
Social Cost of Serious Casualty Crashes \$million per 100 million <i>vehicle kilometres travelled</i>	3.02	2.94	2.80	2.58	2.76

Source: National Performance Indicators, 1998, the Australian and New Zealand Road System and Road Authorities (Austroads) Sydney, 1999.

9.43 The statistics in Table 9E indicate that road safety on Victorian roads improved in each of the 3 years 1995, 1996 and 1997 when measured in terms of serious casualty crashes, road fatalities and persons hospitalised relative to movements in population and road usage. This progressive improvement can be attributed to the collective programs of a number of State agencies including VicRoads, the Transport Accident Commission of Victoria and the Victoria Police.

9.44 However, as shown in the table, the position has deteriorated in respect of all of these particular indicators in Victoria in the 1998 statistics. VicRoads indicated that this situation has resulted from increased proportions of accidents involving young people and accidents on rural roads.

9.45 As an important road safety initiative, VicRoads has introduced a policy requiring road safety reviews to be carried out at various stages, commencing with the planning of road construction projects, to identify in advance potential safety hazards such as driver visibility limitations. The policy requires that

- *“... Major Projects, Regions and relevant departments within VicRoads shall carry out Road Safety Reviews throughout the planning, design and construction stages of new projects to assist in achieving extensions and improvements of the road network to comply with appropriate standards and good road safety practices;*
- *Road Safety Reviews are carried out to identify issues of concern from a safety perspective so that those who are responsible for delivering the particular outcome (conceptual design, functional plans, detailed plans of works) can take these findings into account and make amendments where justified; and*
- *all projects with an estimated construction cost exceeding \$5 million shall be reviewed at all stages from planning through to pre-opening”.*

9.46 Other initiatives by VicRoads, directly concerned with the design and construction of roads, have included:

- The development on freeways and major urban roads of newer types of road surface, such as *open-graded asphalt* and *ultra-thin asphalt*, designed to improve driving safety. These surfaces allow for quicker drainage of water from the road surface which reduces spray, improves visibility and lowers braking distance in emergency situations; and
- The gradual introduction of audible warnings through *tactile edging* on freeways to warn drivers if they inadvertently stray to the road edge.

9.47 In a paper presented to the Institute of Transport Engineers’ international conference held in Melbourne in September 1999, the General Manager of Road Safety in VicRoads identified a range of possible new and innovative technologies which have the potential to deliver substantial road safety benefits. Such envisaged technologies include speed limiters mounted on speed signs that electronically transmit the appropriate speed restriction to a vehicle’s control system, thereby automatically preventing the vehicle from exceeding the posted speed.

9.48 It can be seen that VicRoads places significant corporate emphasis on continually improving, within the boundaries of its control and responsibility, the safety of the road network.

Smooth travel exposure

9.49 The national performance indicator, *smooth travel exposure*, reported by Austroads, deals with the roughness of road surfaces within Victoria's declared road network (of freeways, highways, forest and tourist roads, and main roads) managed by VicRoads. For certain main roads, relevant local government authorities are responsible for road construction and maintenance. This indicator measures the proportion of travel undertaken each year on roads of acceptable roughness.

9.50 Within the road construction industry, roughness basically refers to surface undulation or variations in the shape of a road surface. It is recognised that, in addition to having a direct impact on road-user comfort, higher levels of roughness lead to increased vehicle operating costs.

9.51 The November 1992 document *A Stitch in Time*, produced by VicRoads which "outlines the principal findings of a study conducted jointly by VicRoads and Local Government to develop Victoria's road maintenance strategy", identified road roughness as the principal element impacting on user acceptability of road conditions in Victoria. The study utilised market research "to assess user perceptions of the road network and to identify and, where possible, quantify those aspects of road pavement condition which affect user acceptance". The research revealed that:

- "roughness is the principal pavement condition characteristic which correlates with user acceptability; and
- roughness greater than 110 NRM [generally recognised measure of road roughness] is undesirable and roughness greater than 140 NRM is unacceptable".

9.52 The survey also identified that:

- "road safety is a priority for all users;
- urban road users are concerned by congestion;
- rural road users are concerned by pavement conditions and edge conditions; and
- road users show a high level of satisfaction with the condition of the road network as a whole, but are dissatisfied with particular roads".

9.53 Analysis of data reported by Austroads in its May 1999 report indicated that:

- for the National Highway System, Victoria has the smoothest roads of mainland Australian States with 90 per cent of all travel undertaken each year on national highways with a roughness below the national roughness standard of 110 NRM;
- the smoothness of all Victorian urban and rural roads in the declared road network (based on roughness data collected for 50 per cent of the road network annually) is better or comparable with other major Australian States; and
- over the last 5 years, the smoothness of Victorian urban roads has improved and for rural roads has been maintained at a constant level over that period.

9.54 As mentioned in an earlier paragraph, the results provided by this indicator do not solely reflect performance in road construction. Any improvement or deterioration in road roughness over time for established roads (the majority of roads contained within this indicator were constructed more than 10 years ago) is likely to be more attributable to the soundness of maintenance practices by VicRoads than the quality or otherwise of the initial road construction.

9.55 Nevertheless, on the basis of the data reported by Austroads, Victoria can be considered to have roads which, in terms of surface smoothness, are better than or comparable with other Australian states.

Traffic noise exposure

9.56 Austroads has established a performance indicator to measure the level of exposure of the community to traffic noise. The reported noise levels are based on data collected by the relevant State road authorities from a random sample of dwellings within capital cities. Austroads plans in future years to extend the measurement process to encompass major provincial cities.

9.57 Noise levels are generally measured in decibels or dB(A), where higher dB(A) values represent louder sound. AustRoads has defined a broad 24-hour measure as “*the equivalent or steady state noise level which represents the varying noise levels throughout a working day*”.

9.58 The latest available data from Austroads on traffic noise exposure covers the financial year 1997-98 and indicates that, in relation to State-managed roads, around 14 per cent of Melbourne dwellings (an increase from 9 per cent in 1996-97) were exposed to traffic noise levels higher than the acceptable industry standard of 68dB(A). This level of exposure of the Victorian community to traffic noise was the highest of all States.

9.59 Factors suggested by VicRoads as contributing to the increase in reported noise levels included the urban form of Melbourne and traffic volumes on arterial roads arising from a restricted capacity to divert heavy transport vehicles from residential areas to freeways.

9.60 Because the indicator is derived from measurements taken from a random sample of dwellings throughout Melbourne, it is of limited usefulness in measuring the performance of VicRoads in minimising traffic noise exposure resulting directly from newly-constructed roads.

9.61 However, VicRoads has established an internal noise control standard for any new arterial road and freeway construction or road widening by 2 or more lanes. It has adopted a more stringent requirement that noise levels arising from these activities must be less than 63dB(A) compared with the industry standard of 68 dB(A) mentioned above. In addition to use of this more demanding standard, VicRoads has determined to measure noise levels between 6 a.m. and midnight when levels are likely to be at their highest.

9.62 In pursuit of this objective, VicRoads has implemented new strategies in road construction to limit traffic noise, including:

- earth mounds or embankments in natural or designed landscaping;
- innovative designs and materials for noise fencing where dwellings are close to major road projects, as on the Eastern Freeway, Western Ring Road and South Eastern Freeway; and
- the development and use of noise-reducing road surfaces such as open-graded asphalt and ultra-thin asphalt on urban roads and significant freeway stretches.

9.63 While the above approach by VicRoads is positive, it does not externally report on its actual performance in this area and information was not readily available during the audit to determine the extent of achievement of the established standard. In the interests of better accountability, VicRoads should move to rectify this position.

User satisfaction

9.64 As mentioned in an earlier paragraph, Austroads has in recent years expanded its reporting framework to incorporate a *user satisfaction index*. This index aims to provide a qualitative indication of users' perceptions of the performance of the road system. The index is based on the results of a telephone survey, conducted by Austroads, of road users aged 17 years or over, involving 400 users in each Australian State and New Zealand. The most recent survey was undertaken in 1998.

9.65 The 1998 survey asked users to rate a wide range of attributes for all types of major roads. Specific attributes included road width, roughness, lighting, rest areas, ease of overtaking, landscaping, noise, pollution, absence of dangerous curves and the availability of information about traffic delays.

9.66 Based on responses provided to Austroads by road users, Victoria achieved the commendable position of having the highest rating for the index of 66.9, compared with a national average of 64.5, indicating a comparatively high level of user satisfaction with the Victorian road network.

9.67 Road users surveyed were not asked to rate the ease of joining urban freeways in terms of visibility and the safety and adequacy of ramps and entry lanes. Given that this issue has received publicity in connection with recent major construction works undertaken in Melbourne, VicRoads should seek to have these matters included in future surveys by Austroads.

PERFORMANCE REPORTING BY VICROADS ON TRAFFIC-RELATED MATTERS

9.68 VicRoads progressively measures the performance of the road network in terms of traffic factors such as travel times, average traffic speeds and traffic delays. The results of this work are published annually by VicRoads in a *Traffic System Performance Monitoring* report. The latest available report was issued in January 1999 and contains information specifically relating to Melbourne and rural arterial roads for 1997-98 as well as trend data for the previous 4 financial years.

9.69 The January 1999 report incorporates information relating to the impact, from a traffic perspective, of recently completed major road construction projects. Examples are presented below:

- “since the Western Ring Road was fully opened in June 1997, the travel speed has been very consistent throughout the whole day even though several sections of the freeway are carrying 90,000 vehicles per day and the volume of commercial vehicles has tripled since November 1995 to 13,000 trucks per day”;
- travel speeds on the South Eastern Freeway rose sharply after completion of overpasses at Toorak, Burke and Tooronga Roads at the start of 1997, although delays were experienced due to City Link road works; and
- following the Eastern Freeway extension from Doncaster Road to Springvale Road in December 1997, “the travel time from Nunawading to the city has improved by 10 minutes in the morning peak even though the 12 and 24 hour volumes of traffic using the freeway east of Bulleen Road have increased by 90 per cent”.



Travel time indicator on the South-Eastern Freeway.

9.70 This annual publication by VicRoads on traffic-related matters provides valuable information concerning the contributions made by road construction projects to savings in travel time for road users.

NEED FOR ENHANCED ACCOUNTABILITY TO THE PARLIAMENT AND THE PUBLIC

9.71 Consistent with the position of other government agencies, the provision by VicRoads of an annual report to the Parliament on its operations and achievements constitutes the major vehicle for discharging its accountability obligations for the utilisation of public funds.

9.72 The following factors reinforce the importance of adequate accountability to the Parliament and taxpayers by VicRoads on its performance as the lead government body responsible for road construction:

- the magnitude of overall road-related expenditure incurred each year (around \$550 million over the 3 year period 1996-97 to 1998-99);
- the scale of capital infrastructure associated with roads;
- the level of anticipated economic and social benefits including enhanced road safety from new road projects; and
- the need to manage related environmental impacts and community concerns.

Information currently reported to Parliament in the annual report

9.73 In its 1997-98 annual report (the latest available during the course of the audit) VicRoads presented information dealing with road construction as part of the overall commentary on its activities in managing the State's road network. The key components of this section of the report are:

- a description of 5 major road projects opened to the public during the year highlighting project costs and the perceived benefits to the community such as improved travel times and reduced noise levels;
- a broad outline of projects in progress and at the planning stage;
- some examples of road and bridge projects undertaken under the Better Roads Victoria Program;
- comment on strategic planning activities including the organisation's role in transport planning and major infrastructure projects such as City Link and Docklands; and
- a brief reference to some performance data on the number of projects completed during the reporting period, the level of road smoothness and the predicted return on construction expenditure for those projects involving the commitment of funding during the year.

9.74 The annual report provides a wide range of meaningful information covering the activities of VicRoads. However, much of the contents encompasses road management matters generally and very little performance material e.g. actual achievements against advance targets relating specifically to road construction, is contained in the document.

9.75 In addition, as referred to in Part 4 of this Report, the corporate plan of VicRoads for 1998-2000 outlines a range of initiatives aimed at improving the State's road network including specific reference to individual road construction projects and related target completion dates. However, VicRoads does not formally report actual progress made in completing these initiatives and meeting project targets in its annual report.

9.76 There is, therefore, scope for VicRoads to improve the line of accountability to the Parliament and community on its periodic performance in the specific area of road construction.

Avenues available to enhance annual reporting to the Parliament

9.77 The need for the development of more definitive performance-related information on road construction is reinforced by the fact that the national performance framework set up under Austroads is a major avenue for external performance reporting by VicRoads.

9.78 As previously mentioned in this Part of the Report, several important qualifications have to be applied to the national performance framework when forming judgements on the quality of Victoria's overall performance and there is very limited information of direct relevance to road construction in the national data. Nevertheless, it is recognised that this national framework provides relatively useful data on Victoria's overall performance on road matters in comparison to other States and, in turn, on the calibre of strategic and operational management by VicRoads.

9.79 While individual road construction projects are approved and funded by government on the basis of predicted outcomes and benefits (such as cost savings, traffic volumes and patterns, safety, accessibility and social and economic benefits) identified in plans prepared by VicRoads, information conveyed to the Parliament within the annual report does not include a comparison of actual achievements arising from individual projects with predicted outcomes and benefits.

9.80 Currently, VicRoads does not measure achievements against social and economic benefits expected from new road construction projects on the ground that such benefits automatically result from the attainment of desired traffic levels and speed improvements.

9.81 While these benefits are very difficult to measure and it may be equally difficult to attribute benefits (if measurable) solely to particular road construction projects, some attempt should be made to determine the extent to which initially established outcomes have been realised. Such action is particularly important given that targeted outcomes form part of the justification for proceeding with multi-million dollar construction projects.

9.82 An example of anticipated social and economic benefits expected from a new project can be seen with the Boronia Rail Crossing project which was aimed at “improving the amenity and utilisation of Boronia shopping centre through construction of an improved rail crossing at Boronia”. This project was completed in December 1998.



Completed rail and road traffic management project at Boronia.

9.83 In this case, a measurement methodology could involve periodic surveys of shoppers and traders to elicit views and compile statistics on the assessed level of improvement in the amenity and utilisation of the Boronia shopping centre following construction of the new rail crossing.

9.84 It is considered that public accountability would be further improved if VicRoads included in its annual report information along the following lines and in a consistent format which facilitates year-by-year comparisons:

- details of each major road construction project (in excess of \$5 million), completed during the financial year, comparing achieved outcomes with those anticipated and actual times and costs with related targets;
- total expenditure on road construction projects during the financial year;
- an analysis of contract cost and time variations including the percentage of contracts completed within specific levels of variations and more detailed comment on any large variations such as cost variations exceeding 25 per cent of the initial contract price;
- performance measures which specifically address the quality of recently-constructed roads, for example, comparison, for a period of time after completion of construction, of actual road performance against pre-determined criteria relating to road smoothness and structural strength;

- the results of regular community surveys regarding the quality of roads, project outcomes and general levels of external satisfaction with the performance of VicRoads; and
- additional relevant information on each project such as the level of community consultation and the extent to which any concerns arising from this consultation have been addressed by VicRoads.

9.85 From an organisational perspective, expansion of the current performance measurement and reporting framework to encompass the matters addressed in the above paragraphs would provide VicRoads with an additional source of performance information of direct relevance to road construction. Such action would also build upon its accomplishments to date and assist it to achieve further ongoing improvement in discharging its important responsibilities in this field.

9.86 In addition, wider annual reporting by VicRoads would better inform the Parliament and the community on the organisation’s performance in managing major road construction activities within Victoria.

SCOPE FOR IMPROVED REPORTING ON OUTPUT BUDGETARY TARGETS

9.87 Performance measurement and reporting functions of public sector agencies across Australia are becoming increasingly significant as governments progressively adopt an output-based approach to resource planning, budgeting and reporting. Within Victoria, an output-based approach has been pursued as an important element of the former government’s Management Reform Program.

9.88 In addition to annual reports presented to Parliament, the annual budget papers, which present budget data on an output basis, constitute a further source of information on performance targets set by government agencies. In the previous government’s 1999-2000 Budget, the relevant information relating to VicRoads was set out in the *Budget Estimates 1999-2000* document (Budget Paper No. 3) within the section dealing with the Infrastructure portfolio. Major outputs and deliverables for road construction within the direct responsibility of VicRoads are reported in this section under the heading *Road System Development* and are outlined in Table 9F below.

**TABLE 9F
MAJOR OUTPUTS/DELIVERABLES FOR ROAD SYSTEM DEVELOPMENT
WITHIN THE DIRECT RESPONSIBILITY OF VICROADS,
1998-99 AND 1999-2000**

<i>Major output / deliverables performance measures</i>	<i>Unit of measure</i>	<i>1998-99 Target</i>	<i>1998-99 Expected</i>	<i>1999-2000 Target</i>
<i>Quantity -</i>				
Length of road pavement	lane km	50 600	50 400	50 500
Number of structures	number	4 640	4 765	4 770
Length of roadside	carriageway km	23 820	23 910	23 950
<i>Timeliness -</i>				
Programmed works greater than \$5 million completed on time and on budget	per cent	100	100	100

Source: *Budget Estimates 1999-2000* document (Budget Paper No. 3) prepared by former government.

9.89 It needs to be recognised that the output-based reporting framework is relatively new in Victoria (1998-99 Budget was the first to be presented in an output format) and agencies are still in the process, in conjunction with the Department of Treasury and Finance, of refining performance measures and related targets.

9.90 Given the early stage of development, there is natural scope for improvement in the annual output performance data reported to date for road construction. Some of the limitations of the current measures and targets are mentioned below:

- The timeliness measure for programmed works greater than \$5 million, with a stated 100 per cent target in terms of completion on time and budget, reflects time extensions and cost variations subsequently approved for the various contracts comprising a project.

It would seem more meaningful to set targets for performance against time and cost budgets on a contract basis (e.g. number of contracts completed within a given percentage of initial time deadlines and contract sums, say plus or minus 5 per cent). It would also be useful to develop an indicator comparing initial project cost estimates (i.e. the basis for original State or Australian Government funding) with the aggregate contract sums;

- Currently, no output measures related to the quality of road construction are reported within the budget papers. As mentioned in earlier paragraphs, a measurement of road smoothness (which shows actual roughness against a set maximum standard) could be utilised for a specific period of time after completion of construction works e.g. data could be presented in a time series format indicating performance for roads completed in each of the last 5 years;
- Also, in terms of quality, there is an absence of reporting of the community's views covering construction works while in progress and a period of time following completion of the project. Community surveys could be commissioned to establish satisfaction levels for reporting against pre-determined targets; and
- The 3 quantity measures covering length of road pavement, number of structures and length of roadside present aggregate data which may be of general interest but are, by themselves, of limited usefulness from a performance viewpoint. Such a position is not unusual for most quantity measures.

Nevertheless, consideration could be given to adding a further quantity indicator on the extent of road and bridge construction completed each year by VicRoads, linked to pre-determined targets for high priority projects established by government. Supplementation of the quantitative data with a cost factor such as cost per kilometre for road construction within the various road categories would also enhance the value of the information.

9.91 Action to address these limitations would assist both VicRoads and the Department of Infrastructure in improving the range and usefulness of output measures submitted to the Department of Treasury and Finance for reporting through the annual budget process.

❑ **RESPONSE** provided by the Chief Executive of VicRoads

The 63dB(A) limit for new freeways referred to in paragraph 9.61 is mandatory and must be achieved by contractors. Post construction audits must confirm this on all major projects.

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